JOURNAL OF CHILD AND ADOLESCENT PSYCHOPHARMACOLOGY
Volume 26, Number 1, 2016

Pp. 58–64
DOI: 10.1089/cap.2015.0120

Behavioral Interventions for Anger, Irritability, and Aggression in Children and Adolescents

Denis G. Sukhodolsky, PhD, Stephanie D. Smith, PhD, Spencer A. McCauley, BS, Karim Ibrahim, MS, and Justyna B. Piasecka, MD

Abstract

Objective: Anger, irritability, and aggression are among the most common reasons for child mental health referrals. This review is focused on two forms of behavioral interventions for these behavioral problems: Parent management training (PMT) and cognitive-behavioral therapy (CBT).

Methods: First, we provide an overview of anger/irritability and aggression as the treatment targets of behavioral interventions, followed by a discussion of the general principles and techniques of these treatment modalities. Then we discuss our current work concerning the transdiagnostic approach to CBT for anger, irritability, and aggression.

Results: PMT is aimed at improving aversive patterns of family interactions that engender children's disruptive behavior. CBT targets deficits in emotion regulation and social problem-solving that are associated with aggressive behavior. Both forms of treatment have received extensive support in randomized controlled trials. Given that anger/irritability and aggressive behavior are common in children with a variety of psychiatric diagnoses, a transdiagnostic approach to CBT for anger and aggression is described in detail.

Conclusions: PMT and CBT have been well studied in randomized controlled trials in children with disruptive behavior disorders, and studies of transdiagnostic approaches to CBT for anger and aggression are currently underway. More work is needed to develop treatments for other types of aggressive behavior (e.g., relational aggression) that have been relatively neglected in clinical research. The role of callous-unemotional traits in response to behavioral interventions and treatment of irritability in children with anxiety and mood disorders also warrants further investigation.

Introduction

Childhood disruptive behaviors such as anger outbursts and aggression are among the most frequent reasons for outpatient mental health referrals. In the current version of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5), anger/irritability is the core symptom of oppositional defiant disorder (ODD), and aggressive behavior is most commonly associated with conduct disorder (CD) (American Psychiatric Association 2013). However, children with other psychiatric disorders are also at increased risk of anger and aggression, and disruptive behavior disorders are often comorbid with other forms of psychopathology. For example, in population-based studies, the prevalence rates of disruptive behavior disorders range from 14% to 35% in children with attention-deficit/hyperactivity disorder (ADHD), from 14% to 62% in children with anxiety disorders, and from 9% to 45% in children with mood disorders (Nock et al. 2007). This review is focused on psychosocial interventions for anger/irritability and aggression as dimensions of child psychopathology. Specifically, we include parent management training (PMT) and cognitive-behavioral therapy (CBT), because these modalities have received extensive empirical support as stand-alone interventions that are provided in the format of outpatient psychotherapy (Sukhodolsky et al. 2004; Dretzke et al. 2009). There is also evidence that these behavioral interventions can be helpful in conjunction with medication management for severe aggression (Aman et al. 2014) and as part of multimodal interventions for serious conduct problems, which address multiple risk factors (Sukhodolsky and Ruchkin 2006). First, we provide an overview of anger/irritability and aggression as the treatment targets of behavioral interventions, followed by a discussion of the general principles and techniques of these treatment modalities. Then we discuss our current work concerning the transdiagnostic approach to CBT for anger, irritability, and aggression.

Anger, Irritability, and Aggression as Treatment Targets of Behavioral Interventions

Anger is a negative affective state that may include increased physiological arousal, thoughts of blame, and an increased predisposition toward aggressive behavior (Berkowitz and Harmon-Jones

Child Study Center, Yale University School of Medicine, New Haven, Connecticut.
Funding: This work was supported in part by the National Institute of Mental Health (NIMH) grant R01MH101514 to Drs. Denis Sukhodolsky and Kevin Pelphrey.

2004). Anger is often triggered by frustration or interpersonal provocation. It can also vary in duration from minutes to hours and range in intensity from mild annoyance to rage and fury. Factor-analytical studies distinguish between anger experience (i.e., the inner feeling), and anger expression (i.e., an individual's tendency to show anger outwardly, suppress it, or actively cope with it by deploying adaptive anger control skills) (Spielberger 1988). Improving anger control skills is a primary focus of child-directed CBT approaches that teach skills for coping with anger and frustration that are part of a broader repertoire of emotion regulation strategies.

From the developmental standpoint, various aspects of the experience and expression of anger emerge at different times and follow different developmental trajectories. Temper tantrums that include crying, stomping, pushing, hitting, and kicking are common in 1–4-year-old children and range in frequency from 5 to 9 times per week with an average duration of 5–10 minutes (Potegal et al. 2003). The intensity and number of tantrums tend to decrease with age, although typically developing children continue to outwardly display anger and frustration, behaviors that parents often label as tantrums. This decrease in the frequency of temper tantrums as children age is paralleled by the development of emotion regulation skills and the acquisition of socially appropriate ways to express anger (Blanchard-Fields and Coats 2008). Intense and out-of-control anger outbursts may be of clinical concern in young children (Wakschlag et al. 2010). Intense anger outbursts in response to trivial provocations may also persist across development and manifest across various psychiatric disorders. Because of an apparent lack of control, these behaviors have been referred to as ''rage attacks'' in severe mood dysregulation (Carlson 2007) and Tourette Syndrome (TS) (Budman et al. 2003) as well as ''meltdowns'' in children on the autism spectrum (Samson et al. 2015).

Over the past decade, factor-analytical studies of ODD symptoms have identified a unique dimension of irritability defined by three symptoms: Often loses temper, easily annoyed, and often angry and resentful (Stringaris and Goodman 2009; Burke et al. 2014). As a result, the symptoms of ODD are now grouped into three types: Angry/irritable mood, argumentativeness/defiant behavior, and vindictiveness, which highlights both the emotional and behavioral aspects of this disorder. Longitudinal studies have shown that irritability symptoms in childhood are associated with mood and anxiety disorders later in life, whereas defiance and vindictiveness predict later conduct problems (Whelan et al. 2013). Growing recognition of irritability in childhood psychopathology (Leibenluft and Stoddard 2013) and research on severe mood dysregulation (Leibenluft 2011) have led to adding a new diagnostic category in the DSM-5, disruptive mood dysregulation disorder (DMDD) (American Psychiatric Association 2013). The core symptoms of DMDD include frequent temper outbursts (i.e., three or more times per week) and irritable or depressed mood between the temper outbursts lasting for most of the day nearly every day. Temper outburst may be manifested as verbal rages and/or physical aggression toward people and property.

Aggression can be defined as an overt behavior that can result in harm to self or others (Connor 2002). Several subtypes of aggression (e.g., impulsive, reactive, hostile, affective) have been described based on the presence of an angry affect and contrasted with instrumental, proactive, or planned types of aggression that are not ''fueled'' by anger (Vitiello and Stoff 1997). Another well-known classification distinguishes between overtly confrontational antisocial behaviors, such as arguing and fighting, and covert antisocial behaviors, such as lying, stealing, and breaking rules (Frick et al. 1993). Physical aggression was found to be a significant risk factor for conduct disorder at an early age of onset, later violence, and other mental health problems such as ADHD and anxiety (Loeber et al. 2000). Compared with physical aggression, nonaggressive antisocial behavior was shown to follow a different developmental trajectory (Nagin and Tremblay 1999) and predict later nonviolent criminal offenses (Kjelsberg 2002).

Principles and Efficacy of PMT

The causal pathways to childhood anger/irritability and aggressive behavior involve multiple interacting biological, environmental, and psychosocial risk factors (Loeber et al. 2009). PMT aims to ameliorate patterns of family interactions that produce antecedents and consequences of maintaining tantrums, aggression, and noncompliance. PMT techniques stem from the fundamental principle of operant conditioning, which states that the likelihood of behavior to recur is increased or weakened based on the events that follow the behavior (Skinner 1938). For example, a child is more likely to have another tantrum if previous anger outbursts have resulted in an escape from parental demands or the continuation of a preferred activity. Behaviors such as noncompliance, whining, or bickering may also be reinforced if the same benefits are afforded to the child (Patterson et al. 1989).

Harsh and inconsistent discipline such as excessive scolding and corporal punishment have also been shown to increase aggressive behaviors (Gershoff 2002). The broad goals of PMT are to reduce the child's aggression and noncompliance by improving parental competence in dealing with these maladaptive behaviors. During PMT, parents are taught to identify the function of maladaptive behavior, to give praise for appropriate behavior, to communicate directions effectively, to ignore maladaptive attention-seeking behavior, and to use consistent consequences for disruptive behaviors. PMT is conducted with parents, although for some approaches, children are invited to facilitate the practice of new parenting skills (Eyberg et al. 2008). The efficacy and effectiveness of PMT have been evaluated in >100 randomized controlled studies (Dretzke et al. 2009; Michelson et al. 2013) and excellent treatment manuals are available for clinicians (Kazdin 2005; Barkley 2013). There is evidence that the improvements in child behavior are stable over time and can prevent antisocial behavior in adulthood (Scott et al. 2014).

The relative efficacy of different parent training approaches have not been well studied in randomized controlled studies, but meta-analytic reviews suggest that program components associated with larger effects include increased positive parent–child interactions and emotional communication skills, parental consistency with consequences, and *in vivo* practice of new skills with parents (Wyatt Kaminski et al. 2008). Improving parent–child communication about emotions has become a focus of emotion coaching interventions, which teach parents the importance of acknowledging and accepting their children's emotional experiences as well as modeling for their children how to identify, label, and cope with strong emotions (Ramsden and Hubbard 2002). A recent study of emotion coaching for parents of preschool children found improvements in children's emotional knowledge and reductions in behavior problems (Havighurst et al. 2010). However, adding an emotion coaching component to the already established Positive Parenting Program (Triple-P) did not show additive effects in reducing disruptive behavior (Salmon et al. 2014).

Other developments in parent-directed interventions have included adaptations of PMT for children with specific neurodevelopmental disorders. Our work has shown that PMT could be helpful for disruptive behavior in children with TS (Scahill et al. 2006) and in

children with obsessive compulsive disorder (OCD) (Sukhodolsky et al. 2013). Modifications of PMT for these clinical populations required careful consideration of anger outbursts in the context of symptoms manifesting from the primary disorder. For example, irritability and noncompliance could be associated with OCD-related fears or failure of parents to provide accommodations for compulsive behaviors (Storch et al. 2012). In children with tics, disruptive behaviors have to be disentangled from complex tics that might resemble purposeful behavior (Sukhodolsky and Scahill 2007). More recently, the Research Units on Behavioral Intervention (RUBI) Autism Network has developed and tested a parent training program for irritability and noncompliance in young children with autism (Bearss et al. 2015). In addition to standard PMT strategies, the parent training for children on the autism spectrum contains extensive functional assessment strategies, visual schedules for daily routines, and instructions to parents on how to teach developmentally appropriate and adaptive skills to their children.

Child-Directed CBT Approaches

CBT targets deficits in emotion regulation and social problem-solving skills that are associated with aggressive behavior (Dodge 2003). The label ''cognitive-behavioral'' is used to refer to interventions that are conducted with the child and have an emphasis on the learning principles and the use of structured strategies to produce changes in thinking, feeling, and behavior (Kendall 2006). Common cognitive-behavioral techniques include identifying the antecedents and consequences of aggressive behavior, learning strategies for recognizing and regulating anger expression, problem-solving and cognitive restructuring techniques, and modeling and rehearsing socially appropriate behaviors that can replace angry and aggressive reactions. Although CBT is conducted with the child, parents have multiple roles in treatment, including bringing their child to therapy, providing information about their child's behavioral problems, and creating an environment between sessions that is conducive to their child practicing CBT skills. Importantly, parents are asked to recognize their child's effort when applying emotion regulation and problem-solving skills learned in CBT to anger-provoking situations and to provide praise and rewards for behavioral improvements.

Various cognitive-behavioral approaches place relative emphasis on at least one of three content areas: Regulation of excessive anger, learning social problem-solving strategies, and/or developing social skills alternative to aggressive behaviors. Anger control training (ACT) aims to improve emotion regulation and social-cognitive deficits in aggressive children. Children are taught to monitor their emotional arousal and to use techniques such as cognitive reappraisal and relaxation for modulating elevated levels of anger. As part of the training, children also practice socially appropriate responses to anger-provoking situations such as being teased by peers or reprimanded by adults. Several programs of research have evaluated versions of ACT with children (Lochman et al. 2003), adolescents (Feindler and Ecton 1986; Deffenbacher et al. 1996), and young adults (Kassinove and Tafrate 2002). Problem-solving skills training (PSST) addresses cognitive processes, such as faulty perceptions and decision making that are involved in social interaction. For example, hostile attribution bias or inability to generate alternative solutions may contribute to aggressive behavior. Originating from research on social information processing (Dodge et al. 1990) and problem solving in children (Shure and Spivack 1972), hundreds of studies have examined the association between cognitions in social situations and aggressive behavior (Dodge 2003). Participants of PSST are taught to analyze interpersonal conflicts, to develop nonaggressive solutions, and to think about the consequences of their actions in problematic situations. The efficacy of PSST has been demonstrated in several controlled studies (Guerra and Slaby 1990; Kazdin et al. 1992; Hudley and Graham 1993). There is initial evidence that the effects of PSST on conduct problems may be mediated by a change in the targeted deficits in social information processing (Sukhodolsky et al. 2005). Social skills training (SST) approaches to reducing aggression and developing assertive behavior are rooted in social-learning theory (Bandura 1973). Aggressive youth have been shown to have weak verbal skills, poor conflict resolution skills, and deficits in skills that facilitate friendships (Deater-Deckard 2001). The goal of SST with aggressive youth is to enhance social behaviors that can be deployed instead of aggression, as well as behaviors that can be used to develop friendships with nondelinquent peers. Meta-analytic reviews report moderate effects of SST on disruptive behavior (Losel and Beelmann 2003) and SST is often used as part of multicomponent interventions such as aggression replacement training (Gundersen and Svartdal 2006).

Transdiagnostic Approach to CBT for Anger/Irritability and Aggression

Our approach to CBT for childhood anger and aggression has emerged over the course of three randomized controlled trials (Sukhodolsky and Scahill 2012). The first study evaluated CBT in 33 elementary school children referred by teachers for aggressive behavior in the school setting (Sukhodolsky et al. 2000). Compared with the no-treatment control condition, children who received CBT displayed a reduction in teacher reports of aggression and improvement in self-reported anger control. The second study utilized a dismantling design to investigate the relative effectiveness of the social skills training and problem-solving training components of CBT in 26 children referred by their parents for high levels of aggressive behavior (Sukhodolsky et al. 2005). Children in both conditions showed a reduction in aggression, whereas the problem-solving condition resulted in a greater reduction in hostile attribution bias, and the skills-training condition resulted in a greater improvement in anger control skills. We also evaluated CBT for explosive anger outbursts and aggression in adolescents with TS (Sukhodolsky et al. 2009). TS is characterized by chronic motor and phonic tics that co-occur with disruptive behavior in up to 80% of referred cases (Sukhodolsky et al. 2003). We conducted the first randomized study of CBT for anger control versus treatment as usual in 26 adolescents with TS and disruptive behavior. Assessments, which included evaluations by a blinded rater, parent reports, and child self-reports, were conducted before and after treatment as well as 3 months posttreatment. All randomized subjects completed the endpoint evaluation. The parent rating of disruptive behavior decreased by 52% in the CBT condition compared with a decrease of 11% in the control condition. The independent evaluator who was unaware of treatment assignment rated 9 of 13 subjects (69%) in the CBT condition as much improved or very much improved as compared with 2 of 13 (15%) subjects improved in the control condition. The CBT treatment manual that has been developed in these clinical studies has been recently published by Guilford Press (Sukhodolsky and Scahill 2012). Our team is currently conducting a large randomized trial of efficacy and neural mechanisms of CBT for aggression versus a supportive psychotherapy control condition in children across diagnostic categories, which has been funded in response to the Research Domain Criteria (RDoC) initiative. The design of this study is described in our companion article of this issue (Sukhodolsky at al. 2016 this issue).

The treatment starts with a detailed assessment of the frequency (i.e., number of episodes per week), duration (i.e., time) and intensity (i.e., risk of injury, property damage, and impact on family) of anger outbursts and aggressive behaviors. Aggression is operationalized as instances of verbal threats, physical aggression, property damage, and self-injury (Silver and Yudofsky 1991). Based on a structured clinical interview with the parent(s) and the child, two to three of the most pressing behavioral problems are identified as target symptoms, and used to tailor therapeutic techniques as outlined in the treatment manual (Sukhodolsky and Scahill 2012). The treatment is organized into three modules: Emotion regulation, social problem-solving, and the development of social skills for preventing and resolving conflict situations. The first module starts with identifying anger triggers, developing prevention strategies, and learning emotion regulation skills such as cognitive reappraisal and relaxation training. Sessions 4–6 cover problem-solving skills such as the generation of multiple solutions and the consideration of consequences for different courses of action in conflicts. Sessions 7–9 focus on developing skills for preventing or resolving potentially anger-provoking situations with friends, siblings, parents, and teachers. For example, participants are asked to recall a situation in which they acted aggressively and to role-play behaviors that would have prevented the enactment of aggressive behaviors. Each session consists of a menu of therapeutic techniques and activities that can be use used in a flexible yet reliable manner in order to achieve session goals. Each child session also includes a parent component in which parents are informed about the skills that their child has learned in the session, and a plan is devised that enables the practicing of these skills before the next session. Parents are asked to serve as coaches to facilitate the acquisition of new skills by rewarding nonaggressive behaviors with praise, attention, and privileges. Three separate parent sessions are provided to identify patterns of aversive family interactions that might initiate or maintain a child's aggressive behavior. Parents are then given instruction on how to pay attention to their child's positive behavior and to provide consistent reinforcement for their child's efforts in tolerating frustration and using cognitive problem-solving strategies. Additional parenting strategies discussed in treatment include giving effective commands, ignoring minor misbehaviors, and setting up behavioral contracts.

Although excellent treatment manuals are available in the area of child and adolescent anger control (Feindler and Ecton 1986; Lochman et al. 2008), most are written in a group therapy format for use in school or inpatient settings. Our manual has been structured for providing CBT during individual outpatient psychotherapy. Another feature that sets our approach apart is the focus on a flexible yet consistent implementation of CBT in children and adolescents with moderate to severe anger/irritability and physical aggression in the outpatient setting. The manual provides guidelines for flexible delivery by allowing therapists to select from several numbered activities that correspond to each session's treatment goals, which can be matched to targeted behavioral problems on the one hand and to the child's motivation and developmental level on the other hand. Lastly, the manual contains treatment fidelity checklists to aid in evaluating treatment adherence, an important part of implementing treatment in a reliable fashion (Perepletchikova and Kazdin 2005).

Considerations for Future Research

Although a considerable number of clinical studies have been dedicated to physical aggression, little is known about the treatment of relational aggression. Relational aggression refers to hurting others by damaging their personal relationships or social status, in contrast to overt aggression, which involves hurting someone by physical means (Crick and Grotpeter 1995). Although less apparent than overt aggression, relational aggression is associated with depression, social anxiety, and loneliness (Roecker Phelps 2001). To our knowledge, all treatment studies that include relational aggression outcome measures have been conducted in school settings (Leff et al. 2010). A recent study of a 15-week curriculum focused on communication and problem-solving skills for reducing various types of aggression, which showed a decrease in physical aggression, but no change in relational aggression (Espelage et al. 2013). A review of 13 classroom-based prevention programs showed small effect sizes on measures of relational aggression, and concluded that these programs were less effective in addressing relational aggression than overt aggression. A two-pronged approach would help in the development of evidence-based treatments for relational aggression. First, studies of existing behavioral treatments for children with externalizing disorders should include measures of relational aggression. Second, targeted interventions for this form of aggression in children with clinically significant levels of relational aggression should be tested in randomized controlled trials.

Treatment of anger and aggression in the context of co-occurring anxiety and depression poses questions about the sequencing of interventions for primary and secondary symptoms, as well as what risk factors might contribute to the co-occurrence of externalizing and internalizing problems. On the one hand, some studies show that treatment of the primary mood disorder may result in the reduction of associated behavioral problems (Jacobs et al. 2010). On the other hand, disruptive behavior may reduce compliance with psychosocial interventions for internalizing symptoms and contribute to functional impairments conferred by the primary diagnoses (Garcia et al. 2010). Children with elevated symptoms of anxiety/depression demonstrate greater gains following treatment with parent training (Ollendick et al. 2015) and CBT for aggressive behavior (Jarrett et al. 2014). It has been suggested that a combination of permissive and controlling/hostile parenting styles may contribute to co-occurring anxiety and conduct problems (Granic 2014) and parent-focused treatments have been increasingly used for treatment of anxiety in children (Forehand et al. 2013). Similar techniques of cognitive restructuring and problem solving are used within CBT approaches for anxiety/depression and aggressive behavior, which suggests commonality in the emotion regulation skills that are taught to improve both internalizing and externalizing disorders.

Relatively little is known about the treatment of conduct problems in children with callous-unemotional traits (i.e., lack of guilt and empathy). These traits have been associated with persistent and more severe forms of antisocial behavior as well as with distinct neurocognitive deficits in reward processing and social perception (Blair et al. 2015). It has been suggested that reduced sensitivity to negative consequences in children with conduct disorder complicated by callous-unemotional traits may reduce the effectiveness of rewards and discipline-focused components of PMT (Hawes et al. 2014). At the same time, the increased parental warmth and sensitivity that has been observed following treatment with PMT (O'Connor et al. 2013), may serve as the critical element of family-based interventions for ameliorating the lack of empathy and shallow affect conferred by the callous-unemotional traits. One study showed that a 6-hour program that included teaching emotion recognition skills directly to children with high callous-unemotional traits was more effective than parent training, but the effect size for this difference was relatively small (Dadds et al. 2012). This suggests that similar

and, perhaps, longer treatments that teach emotion recognition and social problem-solving skills directly to children in combination with parent-focused interventions that increase parental warmth and the quality of parent–child interactions may be helpful for children with callous-unemotional traits. These hypotheses are awaiting investigation in randomized controlled trials.

Conclusions

PMT and CBT have been well studied in randomized controlled trials in children with disruptive behavior disorders, and studies involving the transdiagnostic approach to CBT for anger and aggression are currently underway. More work is needed to develop treatments for other types of aggressive behavior (i.e., relational aggression) that have been relatively neglected in clinical research. The role of callous-unemotional traits in response to behavioral interventions and treatment of irritability in children with anxiety and mood disorders also warrants further investigation.

Clinical Significance

Anger/irritability and aggression are among the most frequent reasons for mental health referrals in children and adolescents. PMT is a form of behavioral therapy that aims to ameliorate patterns of family interactions that produce antecedents and consequences that maintain the child's anger and aggression. CBT is another well-studied psychosocial treatment for anger and aggression in children and adolescents. During CBT, children learn how to regulate their frustration, improve their social problem-solving skills, and role-play assertive behaviors that can be used during conflicts instead of aggression. Both PMT and CBT can be offered in the format of time-limited psychotherapy in outpatient mental health centers.

Disclosures

Dr. Denis Sukhodolsky receives royalties from Guilford Press for a treatment manual on cognitive-behavioral therapy for anger and aggression in children. Dr. Stephanie Smith, Ms. Spencer McCauley, Mr. Karim Ibrahim, and Dr. Justyna Piasecka report no conflicts of interest.

References

Aman MG, Bukstein OG, Gadow KD, Arnold LE, Molina BSG, McNamara NK, Rundberg-Rivera EV, Li X, Kipp H, Schneider J, Butter EM, Baker J, Sprafkin J, Rice Jr RR, Bangalore SS, Farmer CA, Austin AB, Buchan-Page KA, Brown NV, Hurt EA, Grondhuis SN, Findling RL: What does risperidone add to parent training and stimulant for severe aggression in child attention-deficit/hyperactivity disorder? J Am Acad Child Adolesc Psychiatry 53:47–60.e41, 2014.

American Psychiatric Association: Diagnostic and Statistical Manual of Mental Disorders, 5th edition. Washington, DC: American Psychiatric Association; 2013.

Bandura A: Aggression: A Social Learning Analysis. Oxford: Prentice-Hall, 1973.

Barkley RA: Defiant Children: A Clinician's Manual for Assessment and Parent Training, 3rd ed. New York: Guilford Press; 2013.

Bearss K, Johnson C, Smith T, Lecavalier L, Swiezy N, Aman M, McAdam DB, Butter E, Stillitano C, Minshawi N, Sukhodolsky DG, Mruzek DW, Turner K, Neal T, Hallett V, Mulick JA, Green B, Handen B, Deng Y, Dziura J, Scahill L: Effect of parent training vs parent education on behavioral problems in children with autism spectrum disorder: A randomized clinical trial. JAMA 313:1524–1533, 2015.

Berkowitz L, Harmon–Jones E: Toward an understanding of the determinants of anger. Emotion 4:107–130, 2004.

Blair RJ, Leibenluft E, Pine DS: Conduct disorder and callous-unemotional traits in youth. N Engl J Med 372:784, 2015.

Blanchard–Fields F, Coats AH: The experience of anger and sadness in everyday problems impacts age differences in emotion regulation. Dev Psychol 44:1547–1556, 2008.

Budman CL, Rockmore L, Stokes J, Sossin M: Clinical phenomenology of episodic rage in children with Tourette syndrome. J Psychosom Res 55:59–65, 2003.

Burke JD, Boylan K, Rowe R, Duku E, Stepp SD, Hipwell AE, Waldman ID: Identifying the irritability dimension of odd: Application of a modified bifactor model across five large community samples of children. J Abnorm Psychol 123:841–851, 2014.

Carlson GA: Who are the children with severe mood dysregulation, a.k.a. ''rages''? Am J Psychiatry 164:1140–1142, 2007.

Connor DF: Aggression and antisocial behavior in children and adolescents. New York: Guilford Press; 2002.

Crick NR, Grotpeter JK: Relational aggression, gender, and social-psychological adjustment. Child Dev 66:710–722, 1995.

Dadds MR, Cauchi AJ, Wimalaweera S, Hawes DJ, Brennan J: Outcomes, moderators, and mediators of empathic-emotion recognition training for complex conduct problems in childhood. Psychiatry Res 199:201–207, 2012.

Deater–Deckard K: Recent research examining the role of peer relationships in the development of psychopathology. J Child Psychol Psychiatry. 42:565–579, 2001.

Deffenbacher JL, Lynch RS, Oetting ER, Kemper CC: Anger reduction in early adolescents. J Couns Psychol 43:149–157, 1996.

Dodge KA: Do social information-processing patterns mediate aggressive behavior? In: Causes of conduct disorder and juvenile delinquency. Edited by B.B. Lahey, T.E. Moffitt, A. Caspi. New York: Guilford Press; 2003; pp. 254–274.

Dodge KA, Bates JE, Pettit GS. Mechanisms in the cycle of violence. Science 250:1678–1683, 1990.

Dretzke J, Davenport C, Frew E, Barlow J, Stewart–Brown S, Bayliss S, Taylor RS, Sandercock J, Hyde C: The clinical effectiveness of different parenting programmes for children with conduct problems: A systematic review of randomised controlled trials. Child Adolesc Psychiatry Mental Health 3:7, 2009.

Espelage DL, Low S, Polanin JR, Brown EC: The impact of a middle school program to reduce aggression, victimization, and sexual violence. J Adolesc Health 53:180–186, 2013.

Eyberg SM, Nelson MM, Boggs SR: Evidence-based psychosocial treatments for children and adolescents with disruptive behavior. J Clin Child Adolesc Psychol 37:215–237, 2008.

Feindler EL, Ecton RB: Adolescent Anger Control: Cognitive-behavioral Techniques. New York: Pergamon Press; 1986.

Forehand R, Jones DJ, Parent J: Behavioral parenting interventions for child disruptive behaviors and anxiety: What's different and what's the same. Clin Psychol Rev 33:133–145, 2013.

Frick PJ, Lahey BB, Loeber R, Tannenbaum L, Van Horn Y, Christ MAG, Hart EA, Hanson K: Oppositional defiant disorder and conduct disorder: A meta-analytic review of factor analyses and cross-validation in a clinic sample. Clin Psychol Rev 13:319–340, 1993.

Garcia AM, Sapyta JJ, Moore PS, Freeman JB, Franklin ME, March JS, Foa EB: Predictors and moderators of treatment outcome in the pediatric obsessive compulsive treatment study (POTS I). J Am Acad Child Adolesc Psychiatry 49:1024–1033, 2010.

Gershoff ET: Corporal punishment by parents and associated child behaviors and experiences: A meta-analytic and theoretical review. Psychol Bull 128:539–579, 2002.

Granic I: The role of anxiety in the development, maintenance, and treatment of childhood aggression. Dev Psychopathol 26:1515–1530, 2014.

Guerra NG, Slaby RG: Cognitive mediators of aggression in adolescent offenders: Intervention. Dev Psychol 26:269–277, 1990.

Gundersen K, Svartdal F:Aggression replacement training in Norway: Outcome evaluation of 11 Norwegian student projects. Scandinavian J Ed Res 50:63–81, 2006.

Havighurst SS, Wilson KR, Harley AE, Prior MR, Kehoe C: Tuning in to kids: Improving emotion socialization practices in parents of preschool children–findings from a community trial. J Child Psychol Psychiatry 51:1342–1350, 2010.

Hawes DJ, Price MJ, Dadds MR: Callous-unemotional traits and the treatment of conduct problems in childhood and adolescence: A comprehensive review. Clin Child Fam Psychol Rev 17: 248–267, 2014.

Hudley C, Graham S: An attributional intervention to reduce peer-directed aggression among African-American boys. Child Dev 64:124–138, 1993.

Jacobs RH, Becker–Weidman EG, Reinecke MA, Jordan N, Silva SG, Rohde P, March JS: Treating depression and oppositional behavior in adolescents. J Clin Child Adolesc Psychol 39:559–567, 2010.

Jarrett M, Siddiqui S, Lochman J, Qu L. Internalizing problems as a predictor of change in externalizing problems in at-risk youth. J Clin Child Adolesc Psychol 43:27–35, 2014.

Kassinove H, Tafrate RC: Anger Management: The Complete Treatment Guidebook for Practitioners. Atascadero, CA: Impact Publishers; 2002.

Kazdin AE: Parent management training: Treatment for oppositional, aggressive, and antisocial behavior in children and adolescents. New York: Oxford University Press; 2005.

Kazdin AE, Siegel TC, Bass D: Cognitive problem-solving skills training and parent management training in the treatment of antisocial behavior in children. J Consult Clin Psychol 60:733–747, 1992.

Kendall PC: Guiding theory for therapy with children and adolescents. In: Child and Adolescent Therapy: Cognitive-Behavioral Procedures. Edited by P.C. Kendall. New York: Guilford Press; 2006; pp. 3–30.

Kjelsberg E: Pathways to violent and non-violent criminality in an adolescent psychiatric population. Child Psychiatry Hum Dev 33:29–42, 2002.

Leff SS, Waasdorp TE, Crick NR: A review of existing relational aggression programs: Strengths, limitations, and future directions. School Psych Rev 39:508–535, 2010.

Leibenluft E: Severe mood dysregulation, irritability, and the diagnostic boundaries of bipolar disorder in youths. Am J Psychiatry 168:129–142, 2011.

Leibenluft E, Stoddard J: The developmental psychopathology of irritability. Dev Psychopathol 25:1473–1487, 2013.

Lochman JE, Barry TD, Pardini DA: Anger control training for aggressive youth. In: Evidence-Based Psychotherapies for Children and Adolescents. Edited by A.E. Kazdin, J.R. Weisz. New York: Guilford Press; 2003; pp. 263–281.

Lochman JE, Wells KC, Lenhart LA: Coping Power: Child Group Program. New York: Oxford University Press; 2008.

Loeber R, Burke JD, Pardini DA: Development and etiology of disruptive and delinquent behavior. Annu Rev Clin Psychol 5:291–310, 2009.

Loeber R, Green SM, Kalb L, Lahey BB, Loeber R: Physical fighting in childhood as a risk factor for later mental health problems. J Am Acad Child Adolesc Psychiatry 39:421–428, 2000.

Losel F, Beelmann A: Effects of child skills training in preventing antisocial behavior: A systematic review of randomized evaluations. Ann Am Acad Pol Soc Sci 587:84–109, 2003.

Michelson D, Davenport C, Dretzke J, Barlow J, Day C: Do evidence-based interventions work when tested in the ''Real World?'' A systematic review and meta-analysis of parent management training for the treatment of child disruptive behavior. Clin Child Fam Psychol Rev 16:18–34, 2013.

Nagin D, Tremblay RE: Trajectories of boys' physical aggression, opposition, and hyperactivity on the path to physically violent and nonviolent juvenile delinquency. Child Dev 70:1181–1196, 1999.

Nock MK, Kazdin AE, Hiripi E, Kessler RC: Lifetime prevalence, correlates, and persistence of oppositional defiant disorder: Results from the National Comorbidity Survey Replication. J Child Psychol Psychiatry 48:703–713, 2007.

O'Connor TG, Matias C, Futh A, Tantam G, Scott S: Social learning theory parenting intervention promotes attachment-based caregiving in young children: Randomized clinical trial. J Clin Child Adolesc Psychol 42:358–370, 2013.

Ollendick TH, Greene RW, Austin KE, Fraire MG, Halldorsdottir T, Allen KB, Jarrett MA, Lewis KM, Whitmore Smith M, Cunningham NR, Noguchi RJP, Canavera K, Wolff JC: Parent management training and collaborative and proactive solutions: A randomized control trial for oppositional youth. J Clin Child Adolesc Psychol 2015. Epub ahead of print.

Patterson GR, DeBaryshe BD, Ramsey E: A developmental perspective on antisocial behavior. Am Psychol 44:329–335, 1989.

Perepletchikova F, Kazdin AE: Treatment integrity and therapeutic change: Issues and research recommendations. Clin Psychol Sci Pract 12:365–383, 2005.

Potegal M, Kosorok MR, Davidson RJ: Temper tantrums in young children: 2. Tantrum duration and temporal organization. J Dev Behav Pediatr 24:148–154, 2003.

Ramsden SR, Hubbard JA: Family expressiveness and parental emotion coaching: Their role in children's emotion regulation and aggression. J Abnorm Child Psychol 30:657–667, 2002.

Roecker Phelps CE: Children's responses to overt and relational aggression. J Clin Child Adolesc Psychol 30:240–252, 2001.

Salmon K, Dittman C, Sanders M, Burson R, Hammington J: Does adding an emotion component enhance the Triple P-Positive parenting program? J Fam Psychol 28:244–252, 2014.

Samson AC, Hardan AY, Podell RW, Phillips JM, Gross JJ: Emotion regulation in children and adolescents with autism spectrum disorder. Autism Res 8:9–18, 2015.

Scahill L, Sukhodolsky DG, Bearss K, Findley DB, Hamrin V, Carroll DH, Rains AL: A randomized trial of parent management training in children with tic disorders and disruptive behavior. J Child Neurol 21:650–656, 2006.

Scott S, Briskman J, O'Connor TG: Early prevention of antisocial personality: Long-term follow-up of two randomized controlled trials comparing indicated and selective approaches. Am J Psychiatry 171:649–657, 2014.

Shure MB, Spivack G: Means-ends thinking, adjustment, and social class among elementary-school-aged children. J Consult Clin Psychol 38:348–353, 1972.

Silver JM, Yudofsky SC: The Overt Aggression Scale: Overview and guiding principles. J Neuropsychiatry Clin Neurosci 3:S22–29, 1991.

Skinner BF: The Behavior of Organisms: An Experimental Analysis. New York: Free Press; 1938.

Spielberger CD: Manual for the State-Trait Anger Expression Inventory (STAXI). Odessa, FL: Psychological Assessment Resources; 1988.

Storch EA, Jones AM, Lack CW, Ale CM, Sulkowski ML, Lewin AB, De Nadai AS, Murphy TK: Rage attacks in pediatric obsessive-compulsive disorder: Phenomenology and clinical correlates. J Am Acad Child Adolesc Psychiatry 51:582–592, 2012.

Stringaris A, Goodman R: Three dimensions of oppositionality in youth. J Child Psychol Psychiatry 50:216–223, 2009.

Sukhodolsky DG, Golub A, Stone EC, Orban L: Dismantling anger control training for children: A randomized pilot study of social problem-solving versus social skills training components. Beh Ther 36:15–23, 2005.

Sukhodolsky DG, Gorman BS, Scahill L, Findley DB, McGuire J: Exposure and response prevention with or without parent management training for children with obsessive-compulsive disorder complicated by disruptive behavior: A multiple-baseline design study. J Anxiety Disord 27:298–305, 2013.

Sukhodolsky DG, Kassinove H, Gorman BS: Cognitive-behavioral therapy for anger in children and adolescents: A meta-analysis. Aggress Violent Beh 9:247–269, 2004.

Sukhodolsky DG, Ruchkin V: Evidence-based psychosocial treatments in the juvenile justice system. Child Adolesc Psychiatr Clin N Am 15:501–516, 2006.

Sukhodolsky DG, Scahill L: Cognitive-Behavioral Therapy for Anger and Aggression in Children, New York: Guilford Press; 2012.

Sukhodolsky DG, Scahill L: Disruptive behavior in persons with Tourette Syndrome: Phenomenology, assessment, and treatment. In: Treating Tourette Syndrome and Tic Disorders. Edited by D.W. Woods, J.C. Piacentini, J.T. Walkup. New York: Guilford Press 2007; pp. 199–221.

Sukhodolsky DG, Scahill L, Zhang H, Peterson BS, King RA, Lombroso PJ, Katsovich L, Findley D, Leckman JF: Disruptive behavior in children with Tourette's syndrome: Association with ADHD comorbidity, tic severity, and functional impairment. J Am Acad Child Adolesc Psychiatry 42:98–105, 2003.

Sukhodolsky DG, Solomon RM, Perine J: Cognitive-behavioral, anger-control intervention for elementary school children: A treatment outcome study. J Child Adolesc Group Ther 10:159–170, 2000.

Sukhodolsky DG, Vander Wyk B, Eilbott J, McCauley SA, Ibrahim K, Crowley MJ, Pelphrey KA: Neural mechanisms of cognitive-behavioral therapy for aggression in children: Design of a randomized controlled trail within the RDoC construct of frustrative non-reward. J Child Adolesc Psychopharmacol 2016. In press.

Sukhodolsky DG, Vitulano LA, Carroll DH, McGuire J, Leckman JF, Scahill L: Randomized trial of anger control training for adolescents with Tourette's Syndrome and disruptive behavior. J Am Acad Child Adolesc Psychiatry 48:413–421, 2009.

Vitiello B, Stoff DM: Subtypes of aggression and their relevance to child psychiatry. J Am Acad Child Adolesc Psychiatry 36:307–315, 1997.

Wakschlag LS, Tolan PH, Leventhal BL: Research review: 'Ain't misbehavin': Towards a developmentally-specified nosology for preschool disruptive behavior. J Child Psychol Psychiatry 51:1–22, 2010.

Whelan YM, Stringaris A, Maughan B, Barker ED: Developmental continuity of oppositional defiant disorder subdimensions at ages 8, 10, and 13 years and their distinct psychiatric outcomes at age 16 years. J Am Acad Child Adolesc Psychiatry 52:961–969, 2013.

Wyatt Kaminski J, Valle LA, Filene JH, Boyle CL: A meta-analytic review of components associated with parent training program effectiveness. J Abnorm Child Psychol 36:567–589, 2008.

Address correspondence to:
Denis G. Sukhodolsky, PhD
Child Study Center
Yale University School of Medicine
New Haven, CT 06520

E-mail: denis.sukhodolsky@yale.edu