



Theoretical Model of Mindful Coping Power: Optimizing a Cognitive Behavioral Program for High-Risk Children and Their Parents by Integrating Mindfulness

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Abstract

This paper describes a theoretical model of Mindful Coping Power, a preventive intervention targeting high-risk children and their parents. Mindful Coping Power integrated mindfulness into Coping Power, an evidence-based cognitive behavioral intervention. Reactive aggression is emotionally driven, impulsive, and often referred to as being “hot-blooded.” It has been resistant to change, given the high level of emotional arousal and impulsive angry outbursts. Our premise is that mindfulness impacts the mechanisms of reactive aggression—attentional, cognitive, behavioral, and emotional dysregulation. Also in the model are parents who exhibit emotionally charged interactions with their child. Mindful parenting focuses on parents’ own emotional self-regulation and being fully present with their child. Our model sets the stage for incorporating mindfulness into existing interventions, thereby optimizing programs and maximizing effects.

Keywords Aggression · Prevention · High-risk children · Reactive aggression

Introduction

The purpose of this paper is to delineate a theoretical model of Mindful Coping Power, a preventive intervention for children with high levels of a specific type of aggressive behavior—reactive aggression. As will be described, reactive aggression is ‘hot-blooded.’ Children who are reactively aggressive exhibit attentional, emotional, defensive, and behavioral self-regulatory deficits, and are emotionally driven and impulsive (Fite et al. 2006). To create Mindful Coping Power, we integrated mindfulness and yoga into an existing evidence-based, cognitive behavioral preventive intervention—Coping Power. Development of Mindful Coping Power paralleled the integration of mindfulness into existing programs. As will be described, our integration focused on self-regulatory processes impacted by mindfulness. We begin by providing an overview of mindfulness,

followed by a discussion of integration of mindfulness into existing therapies.

Mindfulness

Mindfulness is the “practice of bringing nonjudgmental awareness to the present moment” (Kabat-Zinn 2013). It has been conceptualized as developing a de-centered or disengaged perspective of one’s experiences (Baer 2003; Shapiro et al. 2006). Through de-centering, thoughts and emotions are perceived non-judgmentally and as transient phenomena. In this way, thoughts and feelings are not necessarily true, and rise and pass on by in the moment. The analogy of a ‘wave’ is commonly used to conceptualize mindfulness, namely, ‘riding the wave’ or ‘wave surfing’ as a strategy to deal with strong urges and emotions without responding reactively. As a result, there may be a change in one’s relationship with their thoughts and emotions and detachment from habitual patterns. Being open to one’s emotions and thoughts enhances the ability to identify emotions early and decrease reactivity towards them. We next discuss how mindfulness has been integrated into interventions.

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Integration of Mindfulness into Existing Therapies

The last two decades have witnessed a new generation of therapies integrating mindfulness into an existing program. One illustration is mindfulness-based cognitive therapy (Segal et al. 2002), where components of mindfulness-based stress reduction (Kabat-Zinn 2013) were integrated into cognitive behavioral therapy. Patients are taught to notice their thoughts and feelings and let them pass on by rather than become attached to them. In this way, patients disrupt habitual dysfunctional ruminative patterns associated with depression. Mindfulness-based cognitive therapy is effective in reducing relapse/recurrence of depression and decreasing anxiety (Coelho et al. 2007; Key et al. 2017; Piet and Hougaard 2011).

Another example of integrating mindfulness is dialectical behavior therapy (Linehan 1993). Dialectical behavior therapy combines cognitive behavioral therapy skills and Eastern meditation techniques from Zen Buddhism. It focuses on tolerating angry and strong feelings and dealing with emotionally driven situations. Key tenets of dialectical behavior therapy are the ‘what’ (observe, describe, and participate) and the ‘how’ (non-judgmentally, one-mindfully). These tenets are then applied to dealing with intense emotions, interpersonal relationships, and tolerating distress. Dialectical behavior therapy is effective in reducing depression, posttraumatic stress disorder, suicidal behavior, and anxiety (Linehan 1993; Van Dijk and Katz 2013). Other effects of dialectical behavior therapy include reduced irritability, aggression and stress (Bohus et al. 2000).

Literature on integrating mindfulness with children’s interventions is very sparse. One randomized controlled trial (RCT) tested the effects of mindfulness-based cognitive therapy for children, which was adapted from mindfulness-based cognitive therapy noted above. The sample consisted of children aged 9–13 with reading difficulties (Semple et al. 2010). Children who completed the program exhibited reduced attention problems and this effect was maintained at the 3-month follow-up. Another study of mindfulness-based cognitive therapy looked at brain changes in a single-group study of adolescents ages 12–18 with anxiety disorder who also had a parent with bipolar disorder (Strawn et al. 2016). Results showed changes in emotional processing regions of the brain. Another study integrated mindfulness in a different program—Strengthening Families. Findings from a RCT showed that the mindfulness-enhanced program (compared to Strengthening Families) led to improvements in fathers’ relationship with their child (Coatsworth et al. 2009). It is worth noting that reactive aggression was not an outcome and the study did not target aggressive children.

There is an inherent conceptual tension between cognitive behavioral and mindfulness theories. One key illustration is that mindfulness theory posits that negative thoughts and feelings are transient states that do not require a behavioral response (Kabat-Zinn 2013). By comparison, in cognitive behavior therapy, dysfunctional thoughts are framed as causing behaviors, and the client is directed to change the content of their thoughts (Seligman and Ollendick 2011). Mindfulness seeks to change one’s relationship with negative thoughts by simply noticing and non-judgmentally accepting them (Kabat-Zinn 2013). In cognitive behavior therapy, clients are directed to restructure the content of their negative thoughts. Yet another distinction is that mindfulness is present oriented, whereas cognitive behavior therapy focuses on the future and behavioral consequences.

This tension between cognitive behavioral and mindfulness theories is a critical issue when considering externalizing behavior problems in children. Cognitive behavior therapy with aggressive children focuses directly on inhibitory control and being able to control one’s behavior (Lochman et al. 1981). In addition, treatment is results-oriented, with concrete behavioral outcomes. Treatment may also include multiple directive self-regulation strategies (e.g., relaxation), as well as use of external structures such as reinforcement of positive behavior and operant points (Seligman and Ollendick 2011).

Research on the effects of mindfulness-based interventions on children and adolescents is in its infancy (Zoogman et al. 2015). The preponderance of studies examined effects on internalizing problems (depression and anxiety) and stress (e.g., Klingbeil et al. 2017; Semple and Lee 2011; Sibinga et al. 2016). In one of the early RCTs with youth, mindfulness-based stress reduction was adapted for adolescents and found to produce reductions in stress, anxiety, and depression (Biegel et al. 2009). A more recent meta-analysis on the effects of mindfulness focused only on stress, anxiety, and depression (Kalliprian et al. 2015). Another example is an RCT of a school-based mindfulness-based intervention. Results showed that the intervention led to significantly lower levels of somatization, depression, negative affect, negative coping, rumination, and posttraumatic symptom severity (Sibinga et al. 2016).

However, with some exceptions (Franco et al. 2016), there is a dearth of research on the effect of mindfulness-based interventions on aggression. That study used a quasi-experimental design to test the influence of mindfulness on children aged 9–13. Mindfulness led to decreased impulsivity and aggression. Indeed, a review of mindfulness-based interventions in schools found no studies targeting aggression in children (Zenner et al. 2014). The need to examine effects on aggressive behavior is particularly critical, as aggression in childhood is predictive of later substance use (Fite et al. 2008a, b), risky sexual behavior (Timmermans

et al. 2008), school dropout (Bierman et al. 2013), and delinquency (Fite et al. 2009). In addition, child psychiatric disorders that include aggression, oppositional defiant disorder, and conduct disorder are highly prevalent (Nock et al. 2007; 10.2% and 9.5%, respectively). Taken as a whole, there is a clear need to widen the focus of research on mindfulness and aggression.

As will be delineated in the next section, a specific form of aggressive behavior, reactive aggression, has been shown to be resistant to change with cognitive behavioral interventions, given the high level of emotional arousal and impulsive angry outbursts (Ellis et al. 2009). Reactive aggression is derived from both anger and fear. Children may be hyper-vigilant and scan their environment for the fear of threat (Fite et al. 2006) and may respond to a perceived threat with an escalation of reactive aggression. Mindfulness offers the possibility of transforming one's relationship with anger and fear by simply noticing it and letting it go, rather than fighting against it.

Two Types of Aggressive Behavior

There is strong empirical support for categorizing aggressive behavior into proactive and reactive aggression (Dodge and Coie 1987; Fite et al. 2006, 2008a). Reactive aggression is emotionally driven, impulsive, defensive, and “hot-blooded” aggression. Reactive aggression manifests in fear responses and defensive actions in response to actual or perceived threats. On the other hand, proactive aggression is “cold-blooded,” unprovoked, calculated, and purposefully goal-directed behavior. Proactive aggression is characterized by motivation towards an external reward. This goal-directed behavior can be object oriented or focused towards dominating others.

Although children can manifest both forms of aggression, factor analytic work consistently finds proactive and reactive aggression to be independent dimensions (Fite et al. 2006), with unique genetic (Bezdjian et al. 2011), and social-cognitive patterns (Bierman et al. 2013; Ellis et al. 2009). In addition, reactive aggression is associated with physiological indicators of stress reactivity that are distinct from proactive aggression (e.g., autonomic arousal, activation of hypothalamic–pituitary–adrenal axis). To illustrate, reactive aggression (but not proactive aggression) is associated with higher cortisol levels (Bezdjian et al. 2011). Furthermore, in response to a provocation task, children with higher reactive aggression evidence higher skin conductance and less cortisol decline during recovery than do children with higher proactive aggression (Lopez-Duran et al. 2009). Compared to children with proactive aggression, children with reactive aggression also display exaggerated electrodermal reactivity

in response to an experimental anger induction task (Hubbard et al. 2002).

These two forms of aggression serve as key predictors of later substance use and delinquency (Fite et al. 2009). Impacting both forms of aggression can best prevent adolescent substance use. However, the pathways through which aggression is linked to substance use differ for proactive and reactive aggression (Fite et al. 2007). Proactive aggression has a direct pathway to substance use. However, the pathway from reactive aggression to substance use is far more complex and involves multiple steps and mediational chains. First, children who are high on reactive aggression become rejected by their peers. The next link is from peer rejection to peer delinquency in that children who are rejected by their peers are more likely to affiliate with delinquent peers. Finally, affiliations with delinquent peers lead to substance use. In terms of substance use, it may be associated with both proactive and reactive aggression. However, underlying mechanisms may differ (Fite et al. 2008b). Reactive aggression is impulsive in nature, and impulsivity is associated with substance use (e.g., Acton 2003; Moeller and Dougherty 2002). Reactive aggression may also be associated with substance use for self-medicating and coping reasons, due to the experience of negative emotions, consistent with research linking temperamental anger to alcohol use initiation (Pardini et al. 2004; Wills et al. 2001).

In the next section, we describe Coping Power, an evidence-based, cognitive behavioral preventive intervention that targets reduction of proactive and reactive aggression to reduce later substance use. As will be discussed next, although Coping Power's effects on proactive aggression are robust, reactive aggression is more resistant to change. This reduced effect on reactive aggression sets the stage for development of Mindful Coping Power, which optimizes the effects of Coping Power through integrating mindfulness.

Coping Power

Coping Power is a cognitive behavioral preventive intervention targeting children at-risk for substance use and delinquency implemented before the transition to adolescence. The one-year version of Coping Power consists of 24 child group sessions that are held at school, and 10 parent group sessions that are held at the school or another community location (Lochman et al. 2014).

Eleven RCTs show that Coping Power prevents substance use, aggression, and delinquency, and promotes social competence and academic functioning from post-intervention through 1–3 year follow-up periods (Cabiya et al. 2008; Helander et al. 2018; Lochman et al. 2006, 2009, 2012, 2014, 2017; Lochman and Wells 2002, 2004; Lochman et al. 2013; Ludmer et al. 2018; Muratori et al.

2017; Peterson et al. 2009; van de Wiel, Matthys et al. 2007). Furthermore, effects on substance use are evident at four-year follow-up (Zonneville-Bender et al. 2007). Coping Power has been tested with thousands of children and is listed on the What Works Clearinghouse at the Institute for Education Science (What Works Clearinghouse 2011). Across studies, sample sizes range from less than 100 to up to 580. Significant effects are found for social behavior at school, externalizing problems, minor assault, and substance use. Effect sizes are small to moderate, typical for many evidence-based targeted prevention programs with behavior problem children. Coping Power is cost effective, with a 54% chance that the program will lead to positive effects over and above its cost (Washington State Institute for Public Policy 2018).

However, as compared to proactive aggression, Coping Power prevention trials reveal that reactive aggression is relatively more resistant to change at post-intervention. Indeed, effect sizes for proactive aggression have been as much as three times the effect sizes for reactive aggression. To illustrate, a trial of Coping Power yielded a 0.48 effect size for proactive aggression, but only a 0.15 effect for reactive aggression (Lochman and Wells 2004). Other interventions also yield small effect sizes for reactive aggression (i.e., Stay Cool Kids, a brief, indicated school prevention program delivered individually (Stoltz et al. 2013). When Coping Power does affect reactive aggression, its impact is most clear at long-term follow-up (i.e., 3-year follow-up; Lochman et al. 2014).

Reactive Aggression and Mindfulness

Our supposition is that the effects of Coping Power can be enhanced by more precisely and intensively targeting the active mechanisms of reactive aggression. As shown in Fig. 1, active mechanisms include attentional, emotional, cognitive and behavioral dysregulation. We will first elaborate on mechanisms of reactive aggression. This is followed by delineation of the effects of mindfulness on these mechanisms.

First, children who are reactively aggressive have *decreased attentional capacity*. They are highly inattentive, impulsive, and excitable. They also have difficulty accurately encoding social cues and recall fewer details of a social situation (Dodge et al. 1997). Consequently, reactively aggressive children may miss critical information that informs their responses to others. Their attention is selective and biased, and focuses on negative interactions such as rejection, ridicule, and failure (Schippell et al. 2003). In addition, as compared to proactive aggression, reactive aggression is more strongly associated with ADHD (Murray et al. 2016).

Children who are reactively aggressive also have difficulty with *emotional self-regulation*. They evidence high levels of anger, intense emotional arousal (Hubbard et al. 2002) and negative emotionality Ellis et al. 2009). From a physiological framework, reactive aggression is associated with autonomic over-arousal, increased amygdala response to social threat (Choe et al. 2015), and increased skin conductance reactivity (Hubbard et al. 2002). Reactive aggressive behavior is defensive in response to provocation, whether the provocation is real or perceived threats.

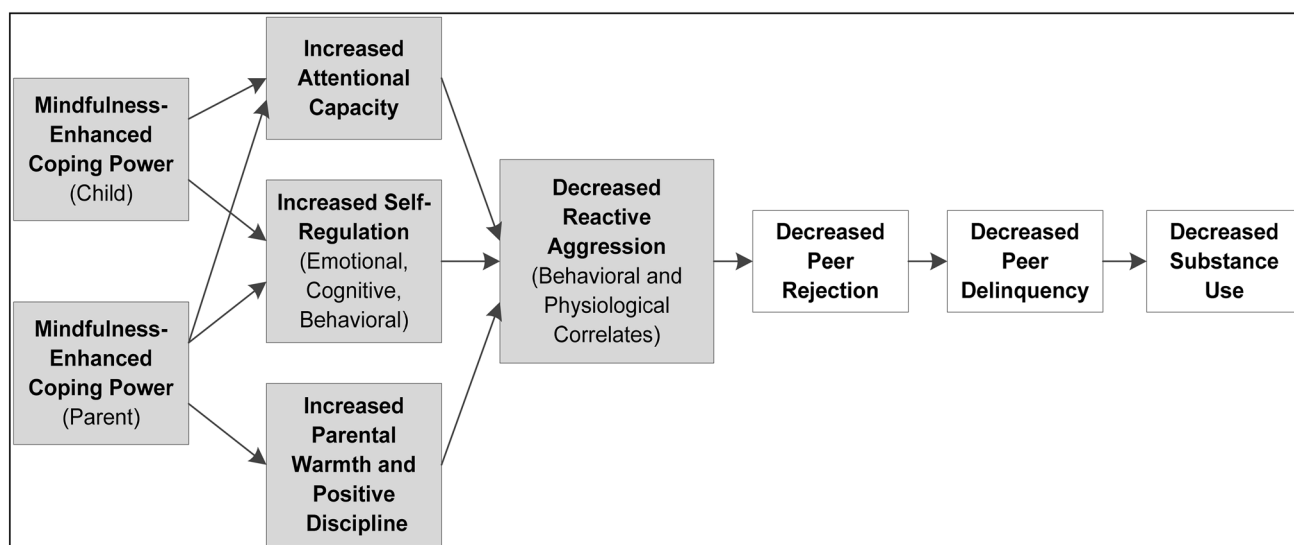


Fig. 1 Theoretical model linking mindfulness, reactive aggression, and substance use

As compared to proactive aggression, reactive aggression is associated with sad, depressed, and angry feelings.

Reactive aggression is also linked with *cognitive dysregulation*. In ambiguous situations, reactively aggressive children perceive hostile intentions, which then leads to emotionally driven, angry responses to perceived provocations or threats. They may also ruminate about their angry moods (White and Turner 2014). This rumination may compromise children's effortful control and their ability to override automatic tendencies towards aggressive behavior. Rumination also interferes with self-regulation of high levels of negative reactivity that leads to reactive aggression. This ruminative cognitive style exacerbates anger arousal and creates a state of readiness for reactive aggression (Denson et al. 2012). Reactive aggression is also linked with deficits in executive function (Rohlf et al. 2018).

Children with reactive aggression also exhibit deficits in *behavioral self-regulation*. When they perceive the slightest threat, they lack behavioral inhibition and respond with angry outbursts and aggression (Ellis et al. 2009). Reactively aggressive children may see an ambiguous situation as antagonistic, and thus respond in retaliation with aggression. As compared to proactive aggression, reactive aggression has a strong relationship with aggressive responses to social conflicts. In addition, relative to children high on proactive aggression, children high on reactive aggression display exaggerated electrodermal reactivity in response to an experimental anger induction task (Hubbard et al. 2002). They may be unable to override the impulse to inflict harm and modulate behaviors (White et al. 2012).

An established body of literature attests to the positive effects of mindfulness on the active mechanisms of reactive aggression (although some evidence shows that outcomes may be similar to other cognitive and behaviorally based programs; Cherkin et al. 2016; Jain et al. 2007). It is well established in the adult literature that mindfulness increases attentional control and capacity. Reactively aggressive children are highly inattentive and impulsive. Mindfulness is linked with decreased attentional impulsivity, for example, pausing before behaving impulsively. Sustained attention decreases distraction and increases attention shifting or changing one's attention from one thing to another (Ortner et al. 2007). Mindfulness also leads to improvements in sustained attention and visual attention. These two specific types of attentional capacity may be particularly relevant to reactive aggression and interpreting social behavior. Specifically, children high on reactive aggression (but not proactive aggression) have difficulty with encoding social cues and may not notice important information about their social context.

Particularly impressive are findings showing that mindfulness improves electrophysiological markers of attentional control (Moore et al. 2012) and functional connectivity in

brain regions important to attention (Creswell et al. 2016). In addition, two single-group design studies of mindfulness interventions with children and adolescents found decreases in ADHD symptoms (van der Oord et al. 2012). Mindfulness may be an effective intervention to supplement stimulant medication for children with ADHD, given associations with attentional regulation.

Studies also show that mindfulness improves emotion regulation. Mindfulness is associated with decreased aggressive anger expression and difficulties regulating emotions (Robins et al. 2012) and emotion arousal (Mendelson et al. 2010). Mindfulness facilitates positive emotional regulation through decreasing the intensity of strong emotions and improving the capacity to recover from emotional distress (Roemer et al. 2015). Mindfulness also leads to decreases in amygdala activation (Desbordes et al. 2012).

Improved emotion regulation is closely linked with reactive aggression. As noted, a key component of mindfulness is acceptance of emotional and thought processes which can thwart typical responses (Hayes 2003). This acceptance facilitates greater flexibility, and typical behavioral and emotional responses will be thwarted and have a greater range. In this way, mindfulness leads to reduced reactivity to negative emotions (Yusainy and Lawrence 2015). In support of this premise, mindfulness is associated with decreased reactivity to emotional stimuli (Bauer et al. 2019; Britton et al. 2012). Also noted previously, mindfulness involves noticing, and then letting thoughts pass on by. However, reactively aggressive children may have thoughts of being rejected by their peers and high levels of anger and retaliation which they have difficulty letting go (Heppner et al. 2008).

Studies also find that mindfulness improves cognitive self-regulation. In an open trial, mindfulness led to decreases in rumination associated with depression (Deyo et al. 2009). Further, mindfulness has positive effects on cognitive flexibility, or the ability to respond non-habitually (Moore and Malinowski 2009). Mindfulness is also associated with decreased cognitive rigidity (Greenberg et al. 2012). In addition, mindfulness is effective in reducing rumination associated with depression (Deyo et al. 2009).

Also related to cognitive self-regulation, mindfulness leads to reductions in biased social information processes (Garland et al. 2017). This may counter social information processes deficits in hostile attributional biases and interpreting negative intent in ambiguous situations frequently seen in reactive, and not proactive aggression (Hubbard et al. 2010). Children high on reactive aggression (but not proactive aggression) have difficulty with another component of social information processes deficits—encoding social cues. In addition, greater behavioral choices may decrease aggressive retaliatory behavior in response to provocation which is also seen in children high on reactive aggression (Yusainy and Lawrence 2015).

Laboratory studies also show effects of mindfulness on cognitive and attentional mechanisms. In the first study, the sample included children who were approximately the same target age range as Coping Power. This single-condition study tested a mindfulness program with children with ADHD aged 7–13 (Huguet et al. 2017). Pre/post results, based on the Stroop measure of executive function, found significant decreases in cognitive flexibility, automatic response inhibition, and attentional capacity. A second study examined the effects of mindfulness training (versus a concentration training group and a non-randomized control group) among fifth graders (Wimmer et al. 2016). Laboratory measures included a vigilance test, a reversible figures test, the Wisconsin Card Sorting Test, a Stroop test, a visual search task, and a recognition task of prototypical faces. Students receiving the mindfulness training evidenced improved cognitive inhibition and information processing.

Also depicted in Fig. 1 is our premise that the effects of Mindful Coping Power can be further optimized by targeting parents as well as children, in particular by targeting parents' own self-regulation and compassion towards themselves and others (especially their child). Parent–child interactions are often emotionally charged, with poor regulation of emotions. Research indicates that parents of children with reactive aggression exhibit less warmth and decreased use of positive discipline strategies (Xu et al. 2009). These interaction styles and parenting practices create a punitive family environment, which promotes children's hypervigilance to threatening cues and social conflict. Over time, children develop a tendency to attribute hostile intentions to ambiguous social interactions. Thus, when coupled with their low threshold for anger, children high on reactive aggression are more likely to respond to peer provocations with angry outbursts (Vitaro et al. 2006).

Mindful parenting focuses on parents' own self-regulation (Duncan et al. 2009). Parents' attentional capacity increases, thus facilitating being non-judgmentally and fully present with their child. Parents also become aware of their parenting-related thoughts and regulate their own emotional and behavioral responses with their child (Coatsworth et al. 2010). In this way, parents lower their emotional reactivity and stress level, connect positively with their child, and model effective emotion regulation. By teaching the same mindfulness skills to both parents and children, effects are likely to be enhanced.

Integration of Mindfulness Strategies into Child and Parent Groups

We can optimize the preventive effects of Coping Power by integrating mindfulness strategies that directly target the active mechanisms of reactive aggression. Our premise is

that integrating mindfulness into Coping Power will lead to significant reductions in reactive aggression immediately after the intervention is completed. This effect is expected to fast-track the process of reducing noxious behaviors towards peers, teachers, and parents that are associated with reactive aggression (e.g., arguing, yelling, pushing, hitting, throwing things, escalating to a level that seems 'out of control'). Reductions in proactive aggression may improve peer relations as well, which may further enhance reductions in reactive aggression long term.

To create Mindful Coping Power, three types of adaptations were made to integrate mindfulness into the existing Coping Power curriculum (see Table 1). The first type of adaptation was to add *mindfulness-only* sessions which occur early in the program in order to teach children and parents core mindfulness skills. These skills are then practiced and discussed throughout the program. We used the phrase 'Notice Right Now' to define mindfulness as noticing the present moment without judgment. This phrase was repeated as an anchor definition throughout the program. The mindfulness-only sessions had a key focus on breath and body awareness. We developed the practice 'Press the Pause and Take 2 Breaths' (PTP and Take 2), which was taught early in the program and then practiced regularly. PTP and Take 2 was a simple and highly effective strategy for children and parents to practice pausing and practicing mindful awareness of breath and body. We also taught participants simple yoga postures and led them in a body scan practice. The purpose of these practices was described as learning to be a 'detective' to notice how your body is feeling, including early signs of emotional arousal and tension. In addition, mindful eating was practiced to enhance sensory awareness.

The second type of adaptation was to add *mindfulness in every session*. A range of mindfulness skills were practiced in every session. Each session opened with a student ringing a chime (mindful listening activity) and a breath awareness practice. These activities offered a ritualized way to practice mindful awareness at the beginning of each session. Each session also included yoga poses to practice body awareness. Closing mindfulness activities included ringing of a chime, a breath awareness practice, and a compassion meditation. Through sequenced loving kindness meditations, children and parents practiced sending and receiving compassion (e.g., to self, family members, fellow group members, teachers, difficult individuals) and strengthening their sense of shared humanity. The compassion practices were called 'Feel and Spread the Good Vibes' for children and 'Feel and Spread the Love' for parents. The following prompt was repeated to extend good wishes to the target(s) of each compassion practice: 'May you be happy. May you be healthy. May you be at peace.' This repetition provides an anchor upon which to practice extending and receiving compassion. Near the end of each session, participants are

Table 1 Integration of mindfulness into Coping Power sessions: Illustrations of three types of adaptations

Mindfulness in every session	Primarily mindfulness sessions (5 child, 3 parent sessions)	Mindfulness-infused existing Coping Power sessions
<ul style="list-style-type: none"> • Chime: Ring chime at beginning and end of every session • Mindful movements/yoga poses to practice body awareness • Press the Pause and Take Two Breaths to practice breath awareness • Compassion and gratitude practice • Mindful home practice (review at beginning of session, assign new home practice at end) 	<ul style="list-style-type: none"> • Mindful eating exercise to practice slowing down and noticing with all five senses • Body scan exercise to practice body awareness and directing attention to specific body parts • Mindful communication exercise to practice listening without interrupting and listening for understanding 	<ul style="list-style-type: none"> • Child: Practice awareness of breath and thoughts before responding to peer conflict • Parent session: Practice using breath and thought awareness before responding to parent–child conflict

given a worksheet to record their daily home mindfulness practice and recordings to facilitate this practice.

A third adaptation strategy was to *integrate mindfulness concepts and practices* into existing Coping Power activities. This approach did not add any new content. Rather, it involved changes to the existing Coping Power curriculum to ensure a seamless infusion of mindfulness into the existing Coping Power curriculum (e.g., to ensure specific phrases and concepts aligned well and to add an intentional ‘pause’ for inner reflection to some of the standard behavioral sequences taught in Coping Power). To illustrate, the existing Coping Power curriculum has several sessions devoted to managing anger arousal. Children practice noticing situations in which they tend to feel angry, how their body feels when they are angry (e.g., face feels hot, muscles get tense, breathing speeds up), and their angry thoughts (e.g., “he is a jerk and I should get back at him;” “I hate my teacher;” “this is so unfair”). Mindful Coping Power includes the same activities, with some differences. One difference is the frequency and intensity of the practice of present awareness. In Mindful Coping Power, children and parents spend time in every session noticing their breathing, body, and thoughts. Participants also engage in weekly home practice activities to strengthen their mindful awareness. These practices are intended to bolster the awareness of anger arousal that is already taught in the standard Coping Power curriculum.

Another example of this integration pertains to practice of managing angry thoughts. In Coping Power, participants focus on actively working to change their angry thoughts. By comparison, in Mindful Coping Power, participants are instructed to simply notice their thoughts and let them pass on by, without attempting to change them. In Coping Power, a student might practice trying to shift from an angry thought (e.g., “he is a jerk, I should get back at him”) to a coping thought (e.g., “don’t be a fool, just stay cool”). In Mindful Coping Power, emphasis is placed on noticing thoughts and letting them drift away, rather than accepting thoughts as “facts” and ruminating on them (e.g., “I am noticing myself having the thought ‘he is a jerk, I should get back at him’... now I am thinking, ‘maybe he is having a bad day because he was picked last for kickball’). This is a subtle change that helps participants observe their thoughts in a more detached way, which can decrease rumination on angry and fearful thoughts. To aid in this process, participants practice using PTP and Take 2 as a way to step back and observe their thoughts and minimize impulsive reactions when anger-aroused.

The majority of activities in Mindful Coping Power are sequenced based on the traditional Mindfulness-Based Stress Reduction training. For example, a cookie exercise is used early in Mindful Coping Power to generate awareness of the senses, similar to the raisin activity in Mindfulness-Based Stress Reduction. Similarly, Mindful Coping Power’s ‘Feel

Table 2 Comparison of Mindful Coping Power and Coping Power: Sample child session

Session 14: social problem solving	Mindful Coping Power activities	Differences from Coping Power
Session objective		
Objective 1: Gathering	<ul style="list-style-type: none"> • Welcome and agenda setting • Select child leadership roles, including mindful leader roles (e.g., ring chime, lead yoga poses, model quiet meditation) 	<ul style="list-style-type: none"> • Coping Power does not include child leadership roles related to mindfulness and yoga practices
Objective 2: Opening mindfulness	<ul style="list-style-type: none"> • Ring opening chime • Mindful movements: Warrior Pose (familiar) Shoulder Rolls (new) • Breath practice: PTP and Take 2 	<ul style="list-style-type: none"> • Coping Power does not include any opening mindfulness practices
Objective 3: Review home practice	<ul style="list-style-type: none"> • Discuss attainment of weekly school behavior goal (e.g., complete all assignments, be respectful to teacher or peers) • Discuss completion of daily mindful home practice (breath awareness practice) 	<ul style="list-style-type: none"> • Coping Power students discuss their attainment of their weekly home behavior goal (e.g., be kind to siblings, keep room clean, be respectful towards parents), which they complete rather than daily mindful home practice
Objective 4: Problem solving: Thinking ahead about consequences	<ul style="list-style-type: none"> • Introduce the concept of thinking ahead about consequences • Brainstorm solutions to a sample problem and identify the likely consequences of each solution 	<ul style="list-style-type: none"> • No difference
Objective 5: Problem solving: Evaluating consequences	<ul style="list-style-type: none"> • Evaluate each consequence • Identify the solution that is likely to work out best 	<ul style="list-style-type: none"> • No difference
Objective 6: Problem solving: Creating space between anger arousal and behavioral response	<ul style="list-style-type: none"> • Practice pausing to notice your emotional arousal and calm self before enacting chosen solution • PTP and Take 2 is included as an overt step in the problem-solving model to calm self before acting 	<ul style="list-style-type: none"> • Coping Power students do not practice PTP and Take 2 as an overt step in the problem-solving model
Objective 7: Assign new home practice	<ul style="list-style-type: none"> • Use mindful problem-solving worksheet to practice solving a real-life problem • Set new weekly school behavior goal • Assign daily mindful home practice: Compassion practice • Review key points discussed in session 	<ul style="list-style-type: none"> • Coping Power students use a problem-solving worksheet that does not include PTP and Take 2 as an overt step • Coping Power students set new weekly home behavior goal (no mindful home practice assigned) • No difference
Objective 8: Review key points		
Objective 9: Reward catalog	<ul style="list-style-type: none"> • Tally points earned by each child. Points earned for Positive participation (includes ensuring that the group milieu is conducive to mindful practice) • Following group rules • Completing daily mindful home practice • Attaining school behavior goal • Spend or save points 	<ul style="list-style-type: none"> • Coping Power students do not receive points for ensuring that the group milieu is conducive to mindful practice • Coping Power students earn points for completing home behavior goals rather than completing mindful home practice
Objective 10: Closing mindfulness	<ul style="list-style-type: none"> • Feel and Spread the Good Vibes compassion practice • Breath practice: 1-min breath awareness with sand timer • Closing chime 	<ul style="list-style-type: none"> • Coping Power students give each other compliments (rather than participating in guided compassion and breath awareness practices)

The problem is:

Get ready to solve the problem by:

- PTP:** Pressing the Pause (PTP) and noticing how I am feeling
- Taking 2:** Taking 2 mindful breaths
- Preparing to Respond not React:** Calming myself and thinking ahead about the best way to handle the situation, rather than reacting out of anger

Possible choices/solutions:

1. _____
2. _____
3. _____
4. _____
5. _____

Consequences of the choices/solutions:

1. _____
2. _____
3. _____
4. _____
5. _____

The choice I think will work out best is:

Reporting back: After you have tried out your choice, describe how it actually went

Fig. 2 Mindful problem-solving worksheet

and Spread the Good Vibes' activity is near the end, similar to Mindfulness-Based Stress Reduction's loving kindness activity. A small number of activities are integrated into Mindful Coping Power based on Coping Power. To illustrate, Coping Power includes sessions on study skills. Mindful Coping Power uses breath awareness to help students from getting dysregulated when doing homework.

In Mindful Coping Power, children and parents also practice creating 'space' between emotional arousal and behavioral response. They practice "sitting with" their breath to detect a change from heightened anger arousal to a greater sense of inner calm. This practice helps participants become more adept at noticing internal physical changes that are early clues of anger arousal and activating the internal processes that reduce anger arousal. Later activities extend this practice to use the space created to generate thoughtful responses to the situation rather than reacting impulsively in anger. In particular, the practice of PTP and Take 2 has been added as an overt step in the problem-solving process that participants are taught, in order to facilitate the practice of creating space between emotional arousal and behavioral response.

Mindful Coping Power also deepens the practice of compassion for self and others. Children participating in both Coping Power and Mindful Coping Power give compliments to each other at the end of each session. In Mindful Coping Power, the practice of extending compassion to self and others is deepened through sequenced guided loving kindness meditations, as described above. These compassion practices can enhance participants' sense of common humanity, strengthening the focus in Coping Power on helping children see situations from others' perspectives (especially in anger arousal situations) and helping parents connect well with their child (even in the presence of challenging behavior).

Table 2 provides an example of integration of mindfulness in a Mindful Coping Power child group session on Social Problem Solving. A child leader is selected to ring the chime at the beginning and the end of the session. A different child assists with leading the group in yoga postures to increase body awareness. Students practice PTP and Take 2 as part of the session opening.

Mindfulness is also integrated into the core Coping Power content for this session by adding PTP and Take 2 as an overt step in the problem-solving model, as a reminder to notice and manage anger arousal before enacting the chosen

Table 3 Comparison of Mindful Coping Power and Coping Power: Sample parent session

Session 6: Family cohesion and problem solving		
Session objective	Mindful Coping Power activities	Differences from Coping Power
Objective 1: Gathering	<ul style="list-style-type: none"> • Food, conversation • Welcome and agenda setting 	<ul style="list-style-type: none"> • No difference
Objective 2: Child group update	<ul style="list-style-type: none"> • Update on recent topics and skills from child group • Discuss children's completion of daily mindfulness home practice 	<ul style="list-style-type: none"> • Coping Power parents discuss children's progress on home behavior goals rather than their mindfulness practice at home
Objective 3: Opening mindfulness	<ul style="list-style-type: none"> • Children lead the parents in yoga poses and PTP & Take 2 Parents select another favorite practice from their "mindful toolbox" to do as a group	<ul style="list-style-type: none"> • Coping Power does not include any opening mindfulness practices
Objective 4: Review and home practice	<ul style="list-style-type: none"> • Discuss parents' use of the skill discussed at the prior session: use of labeled praise to reinforce desired child behaviors • Discuss parents' daily mindfulness practice at home 	<ul style="list-style-type: none"> • Coping Power parents do not engage in daily mindfulness practice at home
Objective 5: Building family cohesion	<ul style="list-style-type: none"> • Discuss ways to strengthen family bonds, such as through regular family special time activities • Practice deep listening as a mindful communication skill for building family cohesion 	<ul style="list-style-type: none"> • Coping Power parents do not practice deep listening as a mindful communication skill for building family cohesion
Objective 6: Family problem Solving	<ul style="list-style-type: none"> • Teach parents to use the mindful problem-solving model to address family conflict • Practice PTP & Take 2 as an overt step to calm self before handling a problem situation • Invite children to show their problem-solving video • Practice family problem solving (using role plays) 	<ul style="list-style-type: none"> • Coping Power does not include an overt step to practice PTP & Take 2 as part of the family problem-solving model
Objective 7: Home practice	<ul style="list-style-type: none"> • Assign mindful home practice (Feel and Spread Love) • Practice family problem solving with real-life problem • Plan 1–2 family cohesion activities 	<ul style="list-style-type: none"> • Coping Power does not include daily mindful home practice. The family problem-solving model does not include PTP & Take 2 to calm self before handling a problem situation
Objective 8: Review and planning	<ul style="list-style-type: none"> • Review key topics • Plan for next session 	<ul style="list-style-type: none"> • No difference
Objective 9: Closing mindfulness	<ul style="list-style-type: none"> • Breath practice • Feel and Spread the Love Meditation 	<ul style="list-style-type: none"> • Coping Power does not include closing mindfulness practices

behavioral solution. Figure 2 shows the Mindful Problem-Solving Worksheet, which includes PTP and Take 2 as an overt step. This step is also included in role plays of the problem-solving model in action. The session ends with discussion of the mindfulness skill that will be practiced between sessions, a closing Feel and Spread the Good Vibes practice, followed by a student ringing the closing chime.

Table 3 provides an example of integrating mindfulness into a Mindful Coping Power parent group session on Family Cohesion and Problem Solving. Parent sessions also open with a series of mindfulness practices (ringing of a chime, a breath awareness practice and gentle yoga poses). Some of these practices are led by child participants to teach their parents what they are learning. The children then leave and parents engage in additional mindfulness practices and discussion only with the other parents. Parent meetings close

with a Feel and Spread the Love compassion practice and identification of a home mindfulness practice to engage in between sessions. Mindfulness is also integrated into the core Coping Power content of the session. Integration occurs by guiding parents in a deep listening practice (i.e., taking turns listening to each other without interrupting, with the goal of understanding key details of what the other person is sharing). Parents discuss how this mindful communication practice can enhance their connection with their child. Another integration of mindfulness occurs in this session by adding PTP and Take 2 as an overt problem-solving step (when addressing a family problem). Parents practice PTP and Take 2 when emotionally aroused to assist with responding thoughtfully rather than reacting impulsively when handling problems situations with family members.

Conclusions

In closing, our theoretical model posits how integrating mindfulness into Coping Power can optimize effects on substance use and delinquency by more precisely targeting the active mechanisms of reactive aggression. Mindful Coping Power was created by integrating mindfulness into an evidence-based cognitive behavioral program. Our theoretical model represents a unique effort to bridge the conceptual and programmatic strengths of a cognitive behavioral intervention with mindfulness to reduce reactive aggression. Mindful Coping Power targets a key predictor of adolescent substance use that has been heretofore resistant to change. Targeting the active mechanisms of reactive aggression and integrating mindfulness is expected to optimize the outcomes of Coping Power that targets children at high risk for substance use. Effects can be further optimized by targeting parents' self-regulation and compassion towards themselves and others. Mindful Coping Power was developed by taking an evidence-based program with proven effects and optimizes it by integrating mindfulness. In this way, Mindful Coping Power takes advantage of the effects of mindfulness, as well as the effects of Coping Power. Mindful Coping Power may prove to be a highly efficacious intervention and pave the way for other similar efforts.

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Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

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