

# Mechanisms of Action in Concurrent Parent-Child Mindfulness Training: a Qualitative Exploration

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**Abstract** This study examined potential processes of change and mechanisms of action in an 8-week manualized mindfulness intervention for adolescents with attention-deficit/hyperactivity disorder (ADHD) and their parents. Five families (five adolescents aged 13–18 and seven parents) participated in semi-structured interviews about their lived experiences of mindfulness 1 to 3 months after the intervention. Thematic analysis guided by a phenomenological approach revealed several potential underlying mechanisms of action contributing to improved peer and family relationship quality after mindfulness training. Themes were consistent among parents and adolescents. Participant descriptions were indicative of enhanced present-focused awareness and detached self-observation, contributing to improved self-monitoring and self-regulation of attention, behavior, and emotions. Participants reported becoming more adept at implementing adaptive emotion regulation strategies (e.g., cognitive reappraisal, problem-solving, and acceptance) and relying less on maladaptive emotion regulation strategies (e.g., rumination). Parents and adolescents described a parallel process of enhanced self-awareness and self-regulation that conjointly contributed to increased empathy, reduced emotional reactivity, improved communication, and reductions in the intensity and duration

of conflicts. Furthermore, as individuals in the parent-child dyad became more adept at regulating their emotions, they mutually reinforced the emotion regulation skills of their social partner. A model of the co-regulatory process of change in parent-adolescent mindfulness training is proposed.

**Keywords** Attention-deficit hyperactivity disorder (ADHD) · Mindfulness · Mindful parenting · Adolescents · Mechanisms · Emotion regulation · Intervention/treatment

## Introduction

Many individuals with ADHD present with features of emotion dysregulation (Barkley 1997; Barkley and Murphy 2010) contributing to functional impairments beyond what is predicted by core ADHD symptoms (Barkley and Fisher 2010). Therapeutic interventions that promote the development of emotion regulation skills, such as mindfulness-based approaches, may mitigate the emotional, behavioral, and social impairments of individuals with ADHD (Cassone 2015). Emerging process-oriented research suggests that improved emotion regulation skills account for a substantial portion of the symptom reduction and enhanced psychological well-being reported after mindfulness training (e.g., Coffey and Hartman 2008; Coffey et al. 2010), but more research is needed to clarify the steps by which change unfolds in this population.

Doss (2004) distinguished between *change mechanisms* and *change processes* in psychotherapy. Enduring changes in participant characteristics or skills occurring during the course of the intervention are considered change mechanisms. These changes, which unfold outside of the weekly meditation group and are generalized to other contexts (e.g., enhanced self-monitoring), are believed to lead to improvements in

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outcome variables (e.g., symptom reduction). Those aspects of the intervention that give rise to improvements in change mechanisms are considered change processes. Change processes include the active ingredients of the intervention, as well as participant experiences or behaviors that are elicited by the intervention. As researchers identify the underlying change mechanisms and the change processes that produced them, these components can be operationally defined and experimentally manipulated to determine the essential components of the intervention. Redundant components can be eliminated, and intervention protocols can be streamlined for a maximally efficient and effective intervention. With the rise of mindfulness-based interventions being implemented in hospitals, schools, workplaces, and mental health care facilities, it is critical to identify the salient features of the intervention responsible for its ameliorative effects.

Mindfulness is most commonly conceptualized as a fluctuating state of non-elaborative awareness of the present moment, cultivated through self-regulation of attention, and an open, curious, and non-judgmental orientation to internal experiences (e.g., Bishop et al. 2004). This mode of awareness can be fostered through formal meditation practice. Although there has been a proliferation of research demonstrating the beneficial outcomes of mindfulness training for adults (for recent reviews, see Chiesa et al. 2011; Keng et al. 2011), research on the applicability of mindfulness for children and adolescents in general, and those with ADHD in particular, is still in early stages (Burke 2010; Zack et al. 2014). Reviews of these preliminary studies indicate that mindfulness shows promise as an adjunct treatment for ADHD, although methodological limitations pertaining to sample size, comparison groups, and randomization limit the conclusions that can be drawn with respect to efficacy (Mitchell et al. 2015). Furthermore, it has been argued that mindfulness training should be considered as a potentially helpful psychosocial family-based treatment to be integrated into existing parenting treatment models for ADHD (Cassone 2015).

Despite the paucity of randomized control trials (RCTs) of mindfulness training for youth with ADHD, results of quasi-experimental and qualitative studies suggest that mindfulness-based interventions reduce ADHD symptoms and co-occurring internalizing and externalizing difficulties and improve emotion regulation. Single-subject multiple baseline evaluations with children with ADHD showed improvements in child compliance to parental request (Singh et al. 2010), increased on-task behavior in class, and improved parent and teacher-rated hyperactivity (Carboni et al. 2013), compared to baseline. A non-controlled evaluation of the Sahaja Yoga Meditation program for children with ADHD and their parents (Harrison et al. 2004) found reductions in parent-rated inattention and hyperactivity/impulsivity as well as parent-child conflict at post-test, irrespective of initial medication status. A mixed group of adults and adolescents with ADHD

participating in an 8-week mindfulness training program demonstrated improvements on objective measures of attention and executive function at post-test, compared to their performance at pre-test (Zylowska et al. 2008). A waitlist control evaluation of a combined mindfulness and martial arts intervention for adolescents revealed that participants with co-occurring ADHD and learning disabilities showed significant improvements in parent-rated externalizing behavior, oppositional defiant problems, conduct problems, and social problems after the 20-week program (Haydicky et al. 2012) and a qualitative study suggested that the program improved adolescents' abilities to remain calm and tolerate and accept difficult emotions (Milligan et al. 2013).

Preliminary research suggests that the mechanisms of change in mindfulness training are complex and multifaceted (Baer et al. 2006) involving alterations in neurological activity, cognition, and behavior (e.g., Chiesa et al. 2011). Holzel et al. (2011) consolidated the findings emerging from the fields of psychology and neuroscience to produce an integrated theory of change. They found that four distinct yet related mechanisms were implicated repeatedly in studies using self-report, behavioral observation, and neuroimaging measures: (1) attention regulation, (2) body awareness, (3) emotion regulation, and (4) change in perspective of the self (i.e., decentering). These components were said to influence and reinforce each other to varying extents under different conditions. Holzel et al. asserted that the ability to regulate attention was a pre-requisite for the development of the other components; thus, attention regulation was positioned as the initiating step in this model. They contended that focusing attention on sensory experiences led to enhanced awareness of somatic and affective states, which was related to the ability to regulate emotions. The positioning of self-as-observer was believed to result in de-identification with mental events, a process known as decentering (Shapiro et al. 2006). This change in perspective of the self was seen as a result of, rather than condition for, enhanced body awareness and emotion regulation. Unlike most conceptual models of mindfulness, this model did not feature acceptance as a component.

In contrast, Teper et al. (2013) model emphasized acceptance as equally important as present-moment awareness in the early stages of mindfulness training and viewed the regulation of attention and affect as outcomes of these processes. They contended that awareness of interoceptive affective cues and acceptance of affective experience alerted meditators to the need for regulation and motivated self-regulatory action. Thus, awareness and acceptance were thought to improve executive functioning. Teper et al. included attention regulation, cognitive flexibility, and inhibitory control under the umbrella of executive function. They posited that improvements in executive functioning led to enhanced emotion regulation abilities in meditators.

Mindfulness-based interventions may exert indirect effects on relationships via the mechanism of enhanced emotion regulation. Long-term meditators become less emotionally reactive to others as a result of decentering, enhanced awareness of emotional triggers and physiological responses to emotions, and acceptance of others (Pruitt and McCollum 2010). Participants' level of dispositional mindfulness is associated with better emotion regulation during conflict with intimate partners (Barnes et al. 2007), and mindfulness training is associated with improved empathy and social perspective taking between partners, marital satisfaction, communication, partner acceptance, and reductions in relationship stress (Atkinson 2013). Block-Lerner et al. (2007) suggested that mindfulness enhances empathy by cultivating awareness and acceptance of one's own feelings, which makes it easier to recognize and understand the emotions of others. The extent to which mindfulness training is associated with enhanced peer and family relationships among adolescents at risk for emotion regulation difficulties, however, has not been examined in previous research.

Several models of mindful parenting have been proposed (e.g., Bögels et al. 2010; Duncan et al. 2009), all of which were based on the premise that the psychological changes associated with mindfulness training inevitably impact intrapersonal and interpersonal relationships. Bögels et al. (2010) model proposed several mechanisms of improved parent-child relationships similar to those described in the literature on romantic relationships. They theorized that reductions in parenting stress, anxiety, and/or depression will likely enhance parenting skills and increase parenting satisfaction, while reductions in rumination and preoccupation may lead to greater attunement, strengthening the security of parent-child attachment. Bogels et al. further proposed that self-acceptance and self-compassion foster compassion for the child, leading to less reactivity in parent-child and co-parenting interactions. Central to this model was the concept of regulating one's thoughts and emotions in order to be present and attuned to other members of the family and to respond skillfully rather than react automatically. In families of children with disruptive behaviors, automatic interaction patterns are often characterized by hurt, anger, and conflict; mindful parenting can help to replace automatic patterns of negative interaction with more thoughtful, measured, and adaptive responses (Dumas 2005).

Coatsworth et al. (2009) developed a set of mindfulness-based activities targeting five dimensions of mindful parenting: (1) listening with full attention, (2) non-judgmental acceptance of self and child, (3) emotional awareness of self and child, (4) self-regulation and low emotional reactivity, and (5) compassion for self and child. The activities were added to a pre-existing parenting program for parents of adolescents. They conducted a randomized waitlist control evaluation comparing the intervention with and without the mindfulness

activities. The greatest gains in parent-adolescent relationship quality occurred in the mindfulness-infused group; mothers in this group reported more improvements in their ability to regulate their anger, attend to their children's emotional experience, and express positive rather than negative affect towards their children. They also indicated that their adolescents expressed more positive and less negative affective behavior towards them, even though the youth did not receive mindfulness training. Improvements in parent-adolescent relationship quality were mediated by increases in maternal mindfulness. These results suggest a mechanism of co-regulation, whereby the improved emotion regulation skills of the parents gave rise to improved emotion regulation skills in children. This mechanism of co-regulation may be particularly important for children with ADHD, as demonstrated by the finding that lower levels of parental emotional reactivity and higher levels of parental emotion regulation and parental emotional coaching of their children, were associated with child emotion regulation during an emotionally arousing task (Melnick and Hinshaw 2000). This suggests that parents play an important role in helping youth with ADHD regulate their emotions *in vivo*, which has implications for family-based interventions.

Results of preliminary investigations of mindful parenting support the proposed mechanism of improved parental emotion regulation as a key factor in enhancing parent-child relationship quality. What remains unknown is whether child mindfulness training uniquely contributes to improved relationship quality via similar mechanisms, particularly among children with ADHD. Due to underlying deficits in executive function and emotion regulation, children with ADHD often exhibit impairments in social-cognitive functioning such as empathy and social-perspective taking (Marton et al. 2009). It is possible that mindfulness training for youth with ADHD may improve executive function and emotion regulation skills, thereby increasing the ability to consider the emotional experience of a social partner and respond appropriately to the social context. Improvements in these domains of child functioning may produce corresponding improvements in parent-child and peer relationship quality. It is not clear whether additional benefits may be experienced when both members of the parent-child dyad receive mindfulness training. Thus, further research is required to examine the mechanism of co-regulation, which may reinforce and maintain the positive outcomes observed after parent mindfulness training.

MYmind is a mindfulness-based family intervention for youth with ADHD and their parents. Several preliminary evaluations of MYmind pointed to reductions in ADHD symptomatology and improvements in parent functioning after the 8-week manualized intervention. Pre-post group designs revealed significant improvements in self-reports of attention, internalizing and externalizing problems, and objective measures of sustained attention among adolescents with

externalizing disorders (Bogels et al. 2008); reductions in parent-rated inattention and hyperactivity among children with ADHD (van der Oord et al. 2012); and reductions in parent-rated inattention, conduct problems, and peer relations problems among adolescents with ADHD (Haydicky et al. 2015). Parents reported reductions in parenting stress, increased levels of mindfulness (Haydicky et al. 2015; van der Oord et al. 2012), and changes in parental over reactivity (van de Weijer-Bergsma et al. 2012; van der Oord et al. 2012). Although these program evaluations provided preliminary evidence of the feasibility and efficacy of MYmind, questions remain regarding what aspects of the interventions were associated with therapeutic change and how these changes came about.

The purpose of the current study was to expand on the findings from our evaluation of MYmind (Haydicky et al. 2015) by exploring the lived experiences of adolescents with ADHD and their parents who participated in the intervention. We used in-depth semi-structured interviews to gain insight into the process and mechanisms of change, particularly the mediating impact of emotion regulation on the intrapersonal and interpersonal functioning of participants. The current study was guided by the following questions: (1) What are the change processes and mechanisms of therapeutic action of mindfulness training for adolescents with ADHD and their parents? (2) How does mindfulness training affect the family and social relationships of adolescents with ADHD?

## Method

### Participants

Participants in MYmind were adolescents between the ages of 13 and 18 with a previous diagnosis of ADHD from a physician, psychologist, or psychiatrist. Current ADHD status was confirmed by clinically elevated inattentive and/or hyperactive-impulsive symptoms, as indicated by a *T* score  $\geq 65$  on at least one of the DSM ADHD subscales of the Conners 3 Parent Report completed prior to the intervention. All adolescents were required to have average cognitive abilities, indicated by an IQ estimate of at least 85 on the Wechsler Abbreviated Scale of Intelligence (WASI). Participants with autism spectrum disorders, youth with severe behavioral problems constituting a safety risk, or those who were living outside of the home were not eligible to participate. At least one parent from each family was required to participate in the intervention. We invited a subset of families who completed the intervention to participate in interviews about their experiences. Sample sizes between 5 and 25 participants have been suggested for in-depth interviewing (Creswell 1998). Given the aims and scope of the current study, we estimated that saturation could be achieved through in-depth interviews with

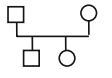
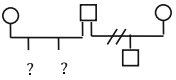
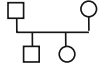
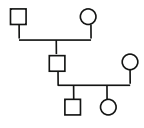
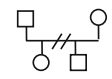
approximately 25% of the overall population of families who participated in MYmind. Thus, five families ( $n = 12$ ) were invited to participate. We used purposive sampling to select families who possessed attributes representative of the diverse population under investigation (Sandelowski 1995). For example, we endeavored to include participants of different genders, marital status, cultural background, age, and comorbid diagnoses. Table 1 provides a summary of participant characteristics.

### Procedures

**MYmind Intervention Overview** MYmind is an 8-week manualized mindfulness-based group treatment program for adolescents with ADHD and their parents that was developed by Bogels et al. (2008) of the University of Amsterdam. Twenty families (20 adolescents, 18 mothers, and 6 fathers) were initially accepted into the program and allocated to one of five treatment groups on a first-come, first-served basis. Parents and adolescents attended parallel groups comprising eight 1.5-h sessions incorporating the key components of the intervention: mindfulness, elements of cognitive behavioral therapy (CBT), and psychoeducation. Participants were introduced to mindfulness concepts such as present-moment awareness, non-judging, acceptance of internal and external experiences, letting go and beginner's mind, through activities and discussions. Formal and informal mindfulness practices included the body scan, 3-min breathing space, sitting meditation, and mindfulness in everyday activities. Home exercises were required, and participants were asked to track the number of minutes of meditation they engaged in at home via daily e-mail questionnaires. All families were given a CD with guided meditations and workbooks summarizing the key concepts and assignments for each week. The youth obtained points for participation in mindfulness exercises in session and at home, which were exchanged for rewards provided by their parents. Approximately 6 weeks following the final session, a booster session was held with parents and teens to review their progress and to support maintenance of their personal practice. Two graduate students with Masters degrees in clinical child psychology facilitated the groups, with one facilitator working with the youth and the other with the parents. Facilitators had training in mindfulness and cognitive behavioral therapy and were supervised by registered psychologists.

The research was approved by the University of Toronto's Research Ethics Board. The first author, who facilitated the adolescent group, conducted all of the interviews. A familiar interviewer was selected to foster comfort, trust, and openness during the interviews. Interviews took place approximately 1 to 3 months after completion of the intervention. Interviews were held in a quiet room free from distractions. When participants entered the room, the purpose and procedures were reviewed, informed consent was obtained, and the interview

**Table 1** Key participant demographic information

Family	Participant Name (Youth, Parent)	Gender (m/f)	Age of Youth	Grade	WASI IQ	C3P Inattention T-Score (Pre)	C3P Hyper/Impulsive T-Score (Pre)	Youth Comorbid Diagnoses	Parent Diagnosis	Family Composition
1	Matt Jennifer	M F	18	12	119	74	67	Learning Disability	ADHD Anxiety	
2	Tony Mary	M F	15	9	101	90	71	Depression	N/A	
3	(Jess) Madeline Tom	F F M	17	12	114	67	64	No formal diagnosis	ADHD (mother)	
4	Georgia Meg Ron	F F M	16	10	90	66	64	Learning Disability Anxiety	N/A	
5	Catherine Andrew Julia	F M F	18 13	12 7	106 122	71 79	72 77	Learning Disability (both)	Chronic Pain	

Participant names are pseudonyms. Names in parentheses participated in the intervention but were not available for the interview

commenced. Parents and adolescents were interviewed separately, with the exception of one mother-son dyad who was interviewed together. Interviews took approximately 1 h.

## Measures

**Screening Measures Used to Determine Eligibility for Participation** The WASI (Wechsler 1999) and the parent version of the Conners third edition (Conners 3-P; Conners 2008) were used to determine eligibility for the research program. The WASI is a standardized abbreviated intelligence test. The vocabulary and matrix reasoning subtests were administered to obtain an IQ estimate. The IQ score derived from two subtests has an average reliability coefficient of 0.96. The Conners 3-P evaluates inattention and hyperactivity/impulsivity, learning problems, aggression, oppositionality, and peer relationships. Internal consistency coefficients range from 0.77 to 0.97.

**Interview Structure and Process of Inquiry** A semi-structured interview was developed for use in the current study. Participants completed a brief guided meditation at the beginning of the interview to encourage mindful presence and focus during the interview. Following this, they were asked to describe their experience of meditation. Participants were prompted as needed to describe the thoughts, feelings, and sensations that arose during the meditation. For the remainder of the interview, participants were asked open-

ended questions to explore the conceptual areas of mindfulness, family relationships, and ADHD. Within each of these broad categories, a variety of questions pertaining to knowledge and facts (e.g., how often do you meditate? For how long?), descriptions (e.g., what did your relationship with your child/parent look like before and after the intervention?), sensory experiences (e.g., how does it feel in your body?), emotions (e.g., what emotions do you experience during an argument with your child/parent?), and opinions/values/meaning (e.g., what does mindfulness mean to you?) were included to capture multiple facets of the phenomena. The interview was conversational in nature, and the interviewer omitted, added, re-ordered, or re-worded questions as needed. When a participant introduced a topic, the interviewer deviated from the interview guide and encouraged him/her to elaborate. In this way, information emerged naturally and the interviewer explored what was most important or pertinent for participants in that moment.

## Data Analyses

We used Giorgi's (1997, 2008) descriptive phenomenological approach for psychological research as a guide for data explication in the current study. Thematic analysis, as described by Braun and Clarke (2006), was used to identify themes related to the research questions. Analysis of this sort is a recursive process requiring flexibility on the part of the researcher. Although data explication proceeded generally in the order

presented below, steps were revisited, and the method evolved and expanded throughout the process. A simple thematic analysis grew into a more conceptually driven search for patterns of meaning similar to a grounded theory approach.

The phenomenological approach recognizes the intersubjectivity between the researcher and the participants (Moustakas 1994) and is predicated on the view that data collection is a process of co-construction (Finlay 2009). Since subjectivity is inevitable, a rigorous research design must acknowledge and, insofar as is possible, attempt to control for the impact of human consciousness on the research (Giorgi 1997). Thus, the researcher must become aware of, and set aside, her preconceptions about the phenomena in order to see what emerges from the data in the present (Giorgi 2008). This process, referred to as bracketing (Giorgi 2008; Moustakas 1994), involves a non-judgmental receptivity to experience, similar to the open and curious attitude cultivated through mindfulness practice. Phenomenological reduction involves describing things as they appear to our senses without further elaboration (Moustakas 1994). Further to the development of a phenomenological attitude, the researcher also must refrain from assuming any truth or reality about the phenomena and acknowledge that any claims made about the phenomena relate solely to the experience of the subject (Giorgi 1997, 2008). There is debate about whether it is desirable or even possible for researchers to set aside their personal experiences and scientific knowledge in this way. It has been suggested that rather than attempting to cleave the researcher from her own beliefs, researcher bias should instead be brought to the fore of the analysis so that its influence can be more easily identified and used as a source of insight during the interpretive process (Finlay 2009). The first author conducted the data analyses, striving to maintain an attitude of critical self-awareness throughout the research process. She attempted to identify her own preconceptions in order to be open to the data as it emerged. While certain sources of bias were easily identified (e.g., desire for positive results, personal beliefs about the benefits of meditation, etc.), it is possible that unconscious beliefs or expectations influenced data interpretation.

After identifying initial impressions and potential themes from each transcript, they were reviewed again to identify elements of the description that conveyed meaning. Meaning units consisted of words, phrases, or multiple sentences that conveyed a single concept. Repetitive statements and units of meaning not related to the participants' experiences of the program were eliminated. Meaning units were transformed into concise and simplified statements that conveyed the crux of the participants' statements. Themes were primarily analyzed at the semantic, or explicit, level. An inductive, data-driven approach was used to search for recurring patterns of meaning units, rather than using a predetermined coding frame. Units of meaning were clustered to form themes and

subthemes under working titles. Themes were characterized by prevalence across the data set (i.e., number of instances), space within each data item (i.e., participant gave considerable attention to the topic), and relevance (i.e., the theme was related to the overall research questions). Adolescent and parent transcripts were analyzed separately. For adolescents, a topic had to be mentioned by at least two of the five participants (40%) to be considered for inclusion as a theme. For parents, the criterion for prevalence was two out of five households. The investigator examined the common and unique themes within each group and created thematic maps illustrating the structure of the phenomena as reported by adolescents and parents. Themes that were consistent across groups were merged, and themes unrelated to the research questions were removed. Rather than presenting all of the quotations pertinent to each theme, a few quotations were selected to convey the essence of the theme. Background information, context, and interpretations were included in the text to make the results meaningful to readers. After thematic analysis was completed, we consulted the literature regarding mechanisms of action in mindfulness meditation to assess whether the results of the current study were consistent with, or contradictory to, existing theories.

In order to reduce the impact of coder bias and to enhance reliability of the results, we implemented several reliability checks throughout the data explication process. Themes were reviewed with a committee of experts on ADHD and mindfulness to ensure that interpretation of the data was consistent with relevant research and theories. A lay (i.e., non-clinician, non-researcher) graduate of a MBCT program was invited to review themes and provide input based on his personal experience of mindfulness training. Finally, results were triangulated with quantitative data analysis of the same intervention (Haydicky et al. 2015) to search for convergence of themes across multiple sources. The integration of results from multiple studies can pose a challenge, as there are few standards or guidelines for synthesizing data generated from mixed method evaluations (McConney et al. 2002). We elected to follow Jang et al.'s (2008) practice of converting quantitative results into narrative descriptions to compare against the themes of the qualitative study and explore the consistencies and inconsistencies between results. Triangulating the data in this way provided support for the results of data explication in the current study. For a detailed description of this process and its outcomes, please see Haydicky 2014.

## Results

The following is an analysis of the potential mechanisms of therapeutic action in MYmind. The themes that emerged from data explication suggest how internal change processes occurring as a result of mindfulness training may lead to

improvements in underlying psychological mechanisms. Participants reported that they adopted a new attitude towards their internal and external experiences characterized by detached observation, awareness, and appreciation of the present moment. Flowing from these change processes, participants reported that they became more adept at monitoring and regulating their thoughts, feelings, and impulses. Self-monitoring and self-regulation are conceptualized as change mechanisms contributing to improved relational outcomes.

### Relating Differently to Internal and External Experiences

**Detached Self-Observation** Participants described adopting the stance of impartial observer with respect to their thoughts. Jennifer explained how the process of “just observing the thoughts come up, noticing them and then shifting them to the side” allowed her to temper the automatic emotional response often triggered by thoughts. Eighteen-year-old Catherine imagined herself in a movie theater, watching her thoughts as they flickered across a screen. Participants explained how, from this vantage point, they were able to examine their thoughts momentarily and then let them go. Catherine’s mother, Julia, found that she was able to observe her passing thoughts “without them affecting me.” Her 13-year-old son, Andrew, described a similar experience: “... thoughts come up and you think about them and then put them aside.” Participants described a decentering from mental events, which allowed them to evaluate their thoughts objectively, or, as Andrew put it, to “see things how it is.”

**Self-Awareness** Interview results suggest that participants developed a deeper awareness of their mental states. Individuals with ADHD depicted their natural state of mind as a jumble of thoughts, feelings, and sensations. Jennifer called it a “bombardment of sensation,” while Catherine described it as “having everything buzzing around in your head.” These participants likened mindfulness to a form of mental spring-cleaning, a process of clearing out and organizing the mind. Jennifer described meditation as “time set aside to unclutter your mind and let all the thoughts go.” She visualized herself placing her thoughts on shelves, storing them for a later time. Her 18-year-old son, Matt, explained how mindfulness helped him hone in on relevant thoughts and filter out extraneous stimuli.

Well, if you’ve got ADD, or at least I’ve got ADD and this is how it affects me. It’s just kind of like you have a thought, and then another thought comes in and goes on top of that one, and then they both kind of mix a little bit, so you’re looking at both of them at the same time, and then more and more and more pile on, until you’ve got this huge stack of thoughts that are all going on at once, and you’re not sure which one to focus on, so mindfulness and meditation gets rid of that huge

stack and brings you back to thinking about more specific things. Helps you focus your thought.

While participants attributed their mental chatter to ADHD, their experiences are not unlike the “monkey mind,” understood in the Buddhist context as the restless, unfocused, uncontrolled mental state experienced by all humans. Through meditation, we can learn to become skilled at quieting thoughts and taming the monkey mind. Participants explained that meditation helped them to organize, prioritize, and clarify their thoughts.

Several adolescents reported enhanced awareness of their ADHD symptoms after MYmind. Fifteen-year-old Tony explained that, prior to the program, he did not notice or think about his ADHD much at all. Psychoeducation, group discussions, and mindfulness exercises drew Tony’s attention to his ADHD. After the program, Tony felt that he had a better understanding of his ADHD and was able to make more positive attributions about it: “MYmind’s definitely given me a lot better of an idea of what it is and how I can control it, and that it’s easy to control it and it’s not always there.” This statement reflected Tony’s hopefulness about his future with ADHD. This hope, combined with his growing interest in and awareness of his ADHD symptoms, motivated Tony to become more active in his own treatment. As a result, he began to implement self-management techniques that reinforced his sense of hope and self-efficacy. He noticed that he was able to temporarily alleviate or manage some of his symptoms when he was aware of them, describing how becoming aware of his motor restlessness enabled him to change his behavior. Other teens corroborated Tony’s experience. Eighteen-year-old Catherine noted that she became more aware of her symptoms in the moment, which allowed her to consciously adapt her behavior to the environment: “because when you’re in the moment, you’re like, ‘oh crap, being extremely ADHD right now, need to try and leave that alone,’ and you can try and leave it alone.”

Participants reported greater awareness of their automatic thoughts, feelings, and behaviors after the intervention. Several parents identified self-awareness as one of the key facets of mindfulness. Jennifer noted that her understanding of mindfulness included, among other things, “cultivating a greater awareness of your own mental states.” Julia concurred when she said, “to me, mindfulness means that you become self aware of your thinking and your actions.” This awareness allowed participants to identify automatic reactions before acting on them. Tom found that his unconscious automatic reactions were more accessible to him at a conscious level. As a result, he was able to evaluate and select a response, rather than impulsively reacting. Thirteen-year-old Andrew also found that he was less impulsive and instead “just now more aware of what I do before I do it.”

**Present-Moment Awareness** Participants reported greater present-centered awareness as a result of MYmind. “Mindfulness is about being in the moment,” explained Julia. “I take every situation in the moment, as it comes towards me.” Prior to mindfulness training, participants described their tendency to dwell on their thoughts about the past or the future, rather than living fully in the present. Eighteen-year-old Catherine reported that prior to mindfulness training, her thoughts automatically turned to worry about the future. After the training, Catherine made a concerted effort to redirect her thoughts to the present moment: “So, being mindful, it’s just like, I need to be in the now. Yeah, I still think about [the future], but it’s less.” Catherine and others realized that they often missed out on experiences because their attention was directed at the past or future. They explained how redirecting their attention to the present allowed them to engage more fully with what was in front of them. Present-moment awareness increased 18-year-old Matt’s sense of clarity about, and connection with, experiences. He explained that mindfulness invited him to “become more in tune with reality, basically. It kind of brings you out of your own mind and into what’s actually happening.” Some participants conveyed a growing sense of “trust in the moment.” They began to rest more comfortably in the present when they realized that the future would unfold from each moment. This allowed them to “live every moment to the fullest,” as Julia put it.

**Discovery** A subset of participants spoke of a process of re-discovery, of finding value or worth in things taken for granted. Fifteen-year-old Tony used the poignant analogy of an adult rediscovering a beloved childhood toy that he had outgrown.

I feel it’s kind of like embracing something, in a way, like using something for more than it’s worth or ... I don’t know how to explain it. It’s kind of like having an old toy that you haven’t used in a while and still using it twenty years later or something.

Tony spoke of embracing experiences more fully, of delving beyond what is known to discover the unexpected or forgotten meaning within. This resonated with Tony’s mom, Mary, who said, “I thought Tony’s analogy of the old toy was kind of interesting. Because it’s a good analogy. Something that’s been sitting there forever and you don’t notice wow that actually has some value. I should pay attention to it.”

A corollary to the process of discovery was the experience of pleasure and appreciation. Simple acts seemed richer and more satisfying. Some adolescents reported enjoying their food more because the flavor was enhanced (“It’s not that it tastes different, but it’s a lot better”). Participants discovered beauty and joy in mundane experiences: “Noticing the sound of the traffic. Noticing what way the wind’s blowing. Different things like that, that make the walk more fun,” explained

Mary. This contributed to the subjective experience of better quality of life. As 18-year-old Catherine attested, “I enjoyed what I was doing more.” One parent shared that the process of discovery was intimately connected to her personal identity. “And it’s like it’s the old me that’s coming out, I think,” said Julia. “What I used to be like when I was younger, before all the responsibility of the children and the learning disabilities and ADHD and the divorce and everything. I used to be very optimistic and outgoing person.” For several participants, the process of rediscovering value, beauty, worth, and meaning in taken-for-granted objects and experiences resulted in greater pleasure in, and appreciation of, life. This act of dwelling deeply in the present exemplifies mindfulness.

### Regulating Behavior, Emotions, and Cognitions

Several parents and adolescents perceived improvements in their ability to regulate their attention and behavior. They believed that they became more adept at selecting, monitoring, and shifting the focus of their attention. Moreover, parents reported improvements in their ability to recognize and inhibit automatic impulses and evaluate response options in order to respond mindfully to others.

**Attention Regulation** Almost all of the participants described meditation as the practice of focusing attention on a single experience or sensation. Ron explained, “for me, my understanding is when you try to be focused on one thing. That’s my definition of my meditation.” Common to most definitions was the aspect of intentionality. Participants noted that mindful attention is conscious, deliberate, and purposeful. As Julia put it, meditation involves skillfully directing attention to “whatever I decide to focus on.” Once the object of attention is selected, extraneous stimuli are actively filtered out. Meg explained how she “put everything away” in order to “focus on one thing.” This form of active, targeted, and honed attention is unlike the poorly regulated and uneven attention that characterizes the typical state of most individuals, especially those with ADHD. Thirteen-year-old Andrew described how his attention often jumped around from moment to moment, “but if you’re more mindful of things you notice that.” Eighteen-year-old Matt explained how he practiced this skill of attention regulation when he noticed his attention straying from an important social interaction. When he recognized his mind wandering, he selected a strategy (breathing space) to re-focus his attention: “And then I kinda do a breathing space and I’m able to shut out whatever’s going on in my mind previously, and bring my attention to what I need to focus on.” This form of attention regulation was effortful and deliberate. Fifteen-year-old Tony noted that when he actively regulated his attention, complex tasks such as concentrating on each of the small movements involved in a skateboarding trick



became simpler. “I just feel that every time I actually focus on what I need to do, it’s a lot easier to do,” he said.

**Behavioral Regulation** Most of the parents reported improved behavioral regulation as a result of the MYmind training. Perhaps owing to their increasing self-awareness, parents were able to recognize and curb their automatic impulses before acting rashly. Ron, for example, realized that he was quick to anger and apt to yell when his son made mistakes in tennis. As he became more aware of his pattern of behavior, he was able to respond differently. Ron explained that he still got upset, but he chose to speak calmly and focus on what his son did well. Ron believes his relationship with his son improved as a result. Another parent, Tom, described how his relationship with his family also changed when he began noticing and regulating his impulses. His wife, Madeline, observed, “I can see you sometimes thinking before you say something to me. You know, like consciously thinking, whereas you would react right off the cuff before.” Tom explained that it required considerable effort and practice for him to respond mindfully to challenging situations. This process of mindful responding, or “getting rid of the reacting” as Mary called it, reportedly led to behavioral changes in parents. According to several parents, responding mindfully is a multi-step process. They highlighted the importance of “stepping back” and “taking time to think.” They explained that when they recognized an automatic impulse, they intentionally paused, creating space between the impulse to act and the action. Within this space, they were able to assess the situation, consider their thoughts and feelings, weigh their options, and select the most appropriate response. Julia outlined the process she referred to as “the old stop-think-review.”

It’s the old stop-think-review. Do and then review. That’s what mindfulness basically is. When you feel something you connect with yourself: Why am I feeling angry? What is it that’s making me feel angry? Then the thought comes. And then you analyze it: Is it real? Is it preconceived? And then make a decision on how you’re gonna deal with something and then review: How did it work?

Responding mindfully, rather than reacting automatically, appears to require the intentional application of a number of executive function skills including response inhibition, metacognition, and self-monitoring. It is interesting to note that although adolescents reported improvements in some components of executive function and emerging self-management skills, they did not explicitly identify behavioral regulation as an area of improvement.

**Emotion Regulation** Most participants reported less emotional reactivity and more effective implementation of strategies to manage negative emotions by the end of the intervention. Adolescents reported feeling less frustrated and

recovering more quickly than they had at the outset of the program. Thirteen-year-old Andrew explained how enhanced focus and the ability to regulate strong emotions helped him with hockey. As a goalie, Andrew felt a lot of pressure to perform well for the sake of his team. When the other team scored a goal against him, he would “keep on thinking about it and get angrier.” Out of sheer frustration, he would “whack my stick against the post,” sometimes breaking the stick entirely. Andrew recognized that his emotions often distracted him from the game, which interfered with his performance. Using mindfulness, Andrew was reportedly able to calm down, filter out the distractions from the spectators, and focus on his task. He declared “now I don’t get as frustrated as I used to.” He explained how he used coping self-talk to regulate his strong emotions related to his athletic performance. “I used to get frustrated with myself ‘cause I couldn’t hit the ball 100%,” he recalled. “But now I just say to myself, ‘I’m not gonna get mad,’ you know?” Fifteen-year-old Tony is a competitive skateboarder. His friends have gotten used to seeing him meditate at the park before getting on his board. Tony does not mind the odd looks he receives sometimes. “I’m sure some of them think I’m weird (...) I think that a lot of my friends understand that it can help a lot.” Tony explained how meditation helped him remain calm and regulate his physiological arousal before competitions. Other teens found that they recovered more quickly after conflict with their parents. Matt found his mother’s reminders less aggravating than usual, and he noted how much easier it was for him to move past his irritation: “and even when she bothered me, I was only angry about it for like 15 minutes or something, and then I could forget about it.” Tony noticed that his anger subsided as quickly as it flared up during arguments with his mother. He described making the choice not to expend energy on anger, “I’ll just have a quick frustration now, and just give up. I’ll be like, Okay you’re doing that and I’m just not going to deal with it. I’m not going to sit and waste my time (laugh).” When Tony realized that holding on to his frustration was unproductive, he was able to let it go.

Parents and teens reported implementing mindfulness strategies to regulate their emotions throughout the day. Matt reflected that meditation freed him from his emotions, “well, during meditation my feelings kind of just go away, and that’s pretty nice actually. It’s kind of nice not to be bothered by feelings.” Tony noticed his attitude and disposition were more positive on days when he meditated. He said, “but the actual day I feel goes a lot better, like I feel like I’m not as angry or anything at people to start out. And I’m not just in a grumpy mood.” In addition to formal meditations, participants reported using the breathing space to cope with feelings as they arose throughout the day. Eighteen-year-old Catherine used the 3-min breathing space to manage her school-related stress and frustration: “It does help though when you’re panicking, the 3 minute thing is great, ‘cause sometimes with the ADD,

you overwhelm yourself...” Her mother Julia explained how she was able to access a space of inner calm in the midst of her busy day.

I’ll be in the car, I’m going to court, and I know I have to face my ex, and judges, and lawyers, and the process (...) And I’ll just stop and breathe. And just close my eyes and deep breaths. And it actually crowds out thoughts, and allows me a moment of peace before I jump back in the fray. It makes me calmer, and I think I appear calmer.

Julia’s daughter observed that her mothers’ use of mindfulness practices not only helped her maintain composure in times of peak stress, but it also attenuated her emotional reactions to ongoing stressors like her divorce. Catherine noted the change in her mother’s emotional reactivity, claiming that mindfulness helped her family learn to accept their emotions rather than avoid them. She indicated that her mother was better able to manage her emotions when she did not try to fight them: “she’s learning it’s okay to feel the way she feels.” For her own part, Catherine attempted to sit with the feelings that made her feel most vulnerable, rather than hiding from them.

I’m learning to go with it, like if I’m sad about something or I’m feeling really upset and I feel tears coming on, I’m not gonna stop them and leave the room, I’m gonna try and talk it out with you and if [the tears] come, they come, but I’m not gonna run away (...).”

Interview themes suggest that participants were more apt to accept, rather than avoid, their emotions and implement strategies to regulate intense emotional responses. Adolescents reported less emotional reactivity and recovered more easily from negative emotions after MYmind.

**Regulating Cognitions** Participants reported greater cognitive flexibility, including growing capacity for cognitive reappraisal, ability to predict various outcomes, and ability to generate multiple solutions to problems. As Julia phrased it, “I don’t think in black and white anymore.” Jennifer described her realization that thoughts are not facts and that she had the choice to perceive things differently. “...a few times I was sort of thinking oh it’s gonna ruin the end of my summer, but then I thought no, I don’t have to take it that way, I have a choice in how I perceive these things actually”. Eighteen-year-old Matt explained how mindfulness illuminated his tendency to “jump to conclusions” and helped him re-evaluate his automatic thoughts, reappraise the situation, and come up with alternative thoughts.

Like if I do something and I instantly think, “oh \*\*\*\*, I shouldn’t have done that,” then I can kind of think about it more clearly using mindfulness strategies, and generally I reach a different conclusion when I stop to really think about something.

Similarly, 18-year-old Catherine found that she was able to consider multiple factors and evaluate all possible outcomes

of a situation, rather than assuming the worst-case scenario: “you’re more aware of other options.”

Meg and Ron also discussed their increasing flexibility with respect to problem-solving and willingness to “try different doors, whatever we can do, whatever works for us, or for her.”

A subset of the participants experienced reductions in rumination, allowing them to live more fully in the present. Thirteen-year-old Andrew, for example, described his tendency to dwell on his mistakes in hockey. The more Andrew ruminated about them, the more careless he became in the present. Andrew explained how interrupting this spiral allowed him to focus on, and ultimately improve, his performance in the present. According to Andrew, “I used to be like, ‘I made a mistake’ and I’d keep on thinking about that one mistake, when really you can’t do anything about it anymore, so there’s no point of thinking about it.” Eighteen-year-old Matt described this as letting go of the negative thoughts he was dwelling on, “it’s just kind of like your problems melt away, and you don’t – if you were dwelling on them, then you’re not afterwards.” Some parents were also susceptible to rumination. Madeline pointed out that Tom’s tendency to “obsess” over things impacted his family relationships. After mindfulness training, she noticed a reduction in his rumination.

**Acceptance of Others** Some parents reflected on the process of accepting others for who they are. In particular, they spoke of the importance of learning to accept their child’s ADHD. Ron and Meg described the stigma associated with a diagnosis of ADHD in their home country in Southeast Asia. “It wasn’t that popular back home at the time,” explained Meg, because the general public was ill-informed about ADHD (“there was a wrong conception”). Meg and Ron found their daughter’s limitations frustrating, and they pushed her to behave like typically developing children. Ron described how they came to accept Georgia’s diagnosis with the support of MYmind.

Yea finally we have to digest what it was (...) at the end of the day, when we had more understanding, I said well maybe she’s a bit different. And just accepting is better than rather than criticizing her and pushing her, because if you push her she can become depressed.

Mary experienced a similar revelation with respect to her son, Tony. Although Mary was educated on the topic of ADHD and was a strong support and advocate for her son, she still found his symptoms frustrating. It was only when she fully accepted Tony with all his strengths and limitations that she felt able to regulate her emotions in order to more effectively accommodate his ADHD. She explained: “...but to actually look at him and say, these are the boundaries he’s dealing with, and instead of getting frustrated by them, accept them and see what we can do to walk the right path, to make things easier for him”. Mary found the concept of acceptance

to be so transformational that she encouraged others to adopt a similar approach. She recalled advising her brother that he would be happier if he accepted their mother rather than trying to change her. “I was trying to teach him acceptance on the spot, I really was.” Mary found that accepting others as they are allowed her to experience relationships in a new way. She advocated acceptance so strongly because she felt it enriched her experience of life and relationships.

I mean acceptance was a big one for me. Very big one. And learning that probably will forever change my world, in a sense of being able to accept really makes me be able to make choices better. Really makes me react better with people at all levels, whether it’s friends, family, work (...) Initially and first and foremost, acceptance was about Tony. But past that, a lot of other areas. And I think it makes a huge difference in how I feel about the world. Not so much how I treat the world, but how I feel.

### Impact on Interpersonal Relationships

Our inquiry was also driven by the question of whether and how mindfulness training affects the family and social relationships of adolescents with ADHD. Participants reported relational improvements, including enhanced social awareness, empathy, and social communication, as a result of mindfulness training. Improvements in self-monitoring and self-regulation seemed to bring about improvement in prosocial skills, which ultimately resulted in reductions in parent-adolescent conflict.

**Improved Social Relationships** Adolescents reported increasing awareness of themselves and others in social contexts, which was linked to improved relationship quality. After MYmind, they felt more connected to their peers, as 18-year-old Matt explained, “I’d say that MYmind, like the central area of my life that it helped me make better was the social part of it. It really helped me kind of like bridge the gap between myself and other people.” Prior to the program, Matt experienced anxiety in social situations, which made it difficult for him to interact with his peers. Matt felt that mindfulness training helped him recognize and regulate his anxiety in social situations. His use of mindfulness strategies reportedly helped him sustain social interactions and communicate more effectively with his peers.

It really helps in social situations, like if I run out of things to say and I start thinking, “oh god, I’m out of things to say. What do I do next to keep this conversation flowing and not awkward?” Then I take a breathing space for a minute or something, and my friends are usually like, “Matt what are you doing?” I’m like, “shhh.” And then when I come back from doing that breathing space or whatever it was called, then I generally find that I’m more able to communicate with people.

Other participants found that they became more sensitive to non-verbal social cues. Sixteen-year-old Georgia described her heightened awareness of her own and others’ non-verbal communication. She found herself attending to “just the body language and the body movement.” She described feeling more receptive to others, “in a way of, I guess, opening up myself to other people.” Fifteen-year-old Tony reportedly became more aware of his friends’ reactions to his hyperactive behavior. “I’m able to actually notice when people are getting frustrated,” he stated. Some participants became more attuned to the experiences of others in social situations. Madeline and Tom noticed their daughter Jess’ increasing ability to consider the perspective of others, a skill that had previously been under-developed. After MYmind, they described Jess as more aware of the impact of her actions on others and especially more sensitive to her brother and more likely to acknowledge her role in arguments with him. Adolescents reported improvements in verbal and non-verbal social communication after mindfulness training. Interview themes suggest that they used mindfulness to manage social anxiety, sustain conversation, pick up on non-verbal social cues, and take the perspective of others.

**Empathy and Perspective Taking Within Families** After MYmind, parents and adolescents reported greater understanding of, and sensitivity to, one another’s thoughts and feelings. The reciprocity of empathy was reflected in Tony’s statement, “I feel we’ve both realized to – not get along better, but understand each other’s feelings a lot more.” Julia reported, “I’m more empathetic, and sympathetic to both my kids.” Julia’s growing awareness of the subjective experience of her children led her to relate to them differently. She explained that she began giving her children transitional warnings between activities because she was able to consider the situation from their perspective, identifying with the feelings of her children by imagining how she might feel in a similar situation. She recognized that it was difficult for her children to suddenly shift their attention from one thing to another and realized they would benefit from a different approach. Similarly, Meg and Ron discussed how increased awareness of Georgia’s state of mind changed the way they responded to her. When Ron considered situations from Georgia’s perspective, he was able to empathize with her struggle to complete tasks that appeared simple to others. Some parents discussed their growing sensitivity to the emotional state of their children. Madeline described her heightened empathy for her daughter’s distress about applying for university. Madeline also noticed that Jess appeared more aware of and interested in her mother’s experience even when stressed due to a test.

...she expressed herself and we went through all that and I was giving her some words of comfort and support, and then she asked me how I was. And... that would never have happened before. ‘Cause when she’s in a stressful situation and...

focused on her own anxiety, there wasn't anyone else that mattered.

Several teens described their increasing awareness of the state of mind of family members. When asked what areas of her life were impacted by the mindfulness training, 18-year-old Catherine responded, "family, as in, I'm trying to take it from other people's perspectives." Catherine explained that this increased her empathy for her younger brother, "I sometimes understand where Andrew's coming from more." For his part, Andrew described his increasing ability to set aside his own feelings in order to take his mother's perspective.

Yea, when sometimes my mom's trying to tell me something and at the moment I think of it as like, she's nagging me. But really, when I actually think about it, she's just trying to help me in any way she can. Being a good mom.

Others also noticed that their frustration with parents decreased as their empathy increased. Sixteen-year-old Georgia interpreted her parents' perfectionism in a new way when she considered things from their perspective.

'Cause I always was really just frustrated with them being like they want to be perfect at anything, but I realize that... what I've realized from my dad's punctuality and my mom's anxiousness, like maybe they do have anxiety disorder but they never really want to admit it, and just want to hide it.

**Mindful Communication Within Families** Families reported improved communication, characterized by mindful listening and sharing more openly with one another, after the intervention. Parents explained that attending MYmind with their teens gave them a topic to stimulate conversation and a common vernacular with which to communicate. Jennifer described how she and her son were able to "share our experiences" during the car ride home after each session: "...it sort of opened up a dialogue that we hadn't had before." Joint participation in MYmind reportedly facilitated meaningful communication between Jennifer and Matt. Similarly, Ron and his daughter Georgia developed a shared vocabulary with which to converse about mindfulness concepts. Ron explained how invoking the common language of breathing space, acceptance, and other key concepts diffused conflicts: "I think with the sessions, at least we have the common terms, right. Rather than maybe in the past we didn't have that. So we would just start attacking whatever." Other parents also noted that they were more likely to communicate respectfully during conflicts using mindfulness strategies. When Mary began taking breathing spaces during arguments, she found that she and her son Tony were able to talk about the problem. "It makes him step away as well," Mary said of the timeouts during arguments, "and then he'll come back and we actually talk." Mary was pleased that she and her son developed a method to "communicate properly instead of screaming," as they were inclined to do before the intervention. Parents noted that as they learned to recognize and manage their emotional

reactions during conversations, they found themselves becoming better listeners. Julia described how her ability to listen mindfully to her children without "reacting and jumping on them" improved throughout the program.

And I listen to them give me feedback on my behavior and I don't take that as a judgment from them, I take that as a "Hey Mom, I'm trying to tell you something." And I'd say a good 80-90% of the time I'm actually able to take it in (...) I'm more open to them.

Likewise, Tom and Madeline observed that their son (who did not participate in MYmind) began sharing more with them when they set aside their automatic judgments and negative reactions. Tom reported that their son was "opening up more about his successes. A little bit about his frustrations." Tom reflected on why his son was communicating more openly: "I think that he doesn't feel to as great an extent that he has to kind of defend himself or justify himself (...)" Several parents reported that when they listened mindfully, with awareness of their own reactions during the interchange, their adolescents began communicating more openly. This communication was perceived to be more positive in nature than it had been prior to the intervention. Meg reported that conversations with her son (who also did not participate in MYmind) became "more positive and he's more open and then we have a good talk, good communication, so it's not tense. So it's just being open and then we talk in a peaceful way." Meg's daughter Georgia explained how the mindfulness training made her want to "be more open" with her parents. She described her effort to improve communication with them, "I try to talk to my parents more and more."

**Reduced Parent-Adolescent Conflict** Most families considered parent-adolescent conflict as a normative developmental process. "Well, I'm a teenager," said 16-year-old Georgia, "of course I'm going to get into fights with them." Fifteen-year-old Tony agreed. "I wouldn't want it to get like a really, really, really good relationship because that would just be creepy," he joked. His mother, Mary, also felt that "it's not normal" for families to have no conflict at all. Another mother, Julia, believed that arguments were opportunities to teach and learn important lessons. Although conflict was regarded as a typical, and even valuable, component of parent-adolescent relationships, most families reported maladaptive levels of conflict when they enrolled in MYmind, identifying reduction in conflict as an intervention goal. Prior to the training, parents and adolescents reportedly frequently engaged in power struggles characterized by anger, poor communication, and poor problem-solving. These conflicts escalated quickly and continued until someone ceded their position or left the interaction. Jennifer described the power struggle that ensued on a regular basis in her household. She explained how her need to prove a point would result in protracted arguments about inconsequential matters. "But there's also a part of me that likes

to have the last word, and actually everyone in the household has this problem,” she said. “I’d feel like I had to argue my point and so we would have conflict often over very stupid little things.” Once locked in this battle, Jennifer and her children had difficulty resolving the conflict. Her 18-year-old son, Matt, developed the strategy of leaving the room and refusing to talk in order to escape the situation, “and then when she realized that she couldn’t get any other responses from me, then she’d just leave me alone after that, pretty much.” In this way, arguments ended abruptly without opportunities for relationship repair or problem-solving. Jennifer and Matt experienced a range of emotions during their arguments. Jennifer explained, “he usually gets really angry at me and I usually feel very angry at him. And I always would feel badly as well that we’re having the argument.” Matt’s frustration with his mother led him to distance himself from her, emotionally and physically. After MYmind training, Jennifer and Matt adopted a new approach to conflict. Jennifer noted, “sometimes I think I’ve been more willing to let things go,” which reduced the frequency and duration of power struggles. She also felt that Matt became more cognizant of his contributions to conflict: “I think sometimes he’s also been sort of more aware of – in retrospect after the argument – he’s been more aware that maybe he went a little overboard on it.” Matt also noticed a reduction in conflict after MYmind. “I hardly ever get into arguments with my parents anymore.” He concurred that his mother was more likely to let small things go, noting that she does not “push things” as much as she used to. He attributed this change to mindfulness training. Similar to Matt, 18-year-old Catherine often fled from conflict to avoid unpleasant emotions. After MYmind, she adopted a new approach characterized by “less pull back, more... compromise, or try to work it out, instead of leaving all the time, ‘cause I used to just leave.” Catherine found that remaining engaged in the interaction helped to resolve the conflict. “It’s beneficial, so instead of just dropping everything that doesn’t work out or seems difficult, it makes me feel like I’ve accomplished things, and I think it helps relationships grow in a positive way,” she explained.

Fifteen-year-old Tony described what conflict with his mother, Mary, looked like prior to the intervention. “It used to be almost like an actual fight. It would pretty much be like screaming so loud (...) you can’t even understand what you’re saying yourself,” he said. Tony described the mounting anger, frustration, and sadness he experienced when his mother did not understand his point of view. Mary described their mutual lack of perspective taking as “head-butting.” She described a similar emotional response to conflict as Tony did, “yea you’re frustrated at the situation, and angry about whatever it is you’re arguing about.” They described how breath awareness changed the way they approached conflict and de-escalated arguments. Mary and Tony engaged in a process of emotional co-

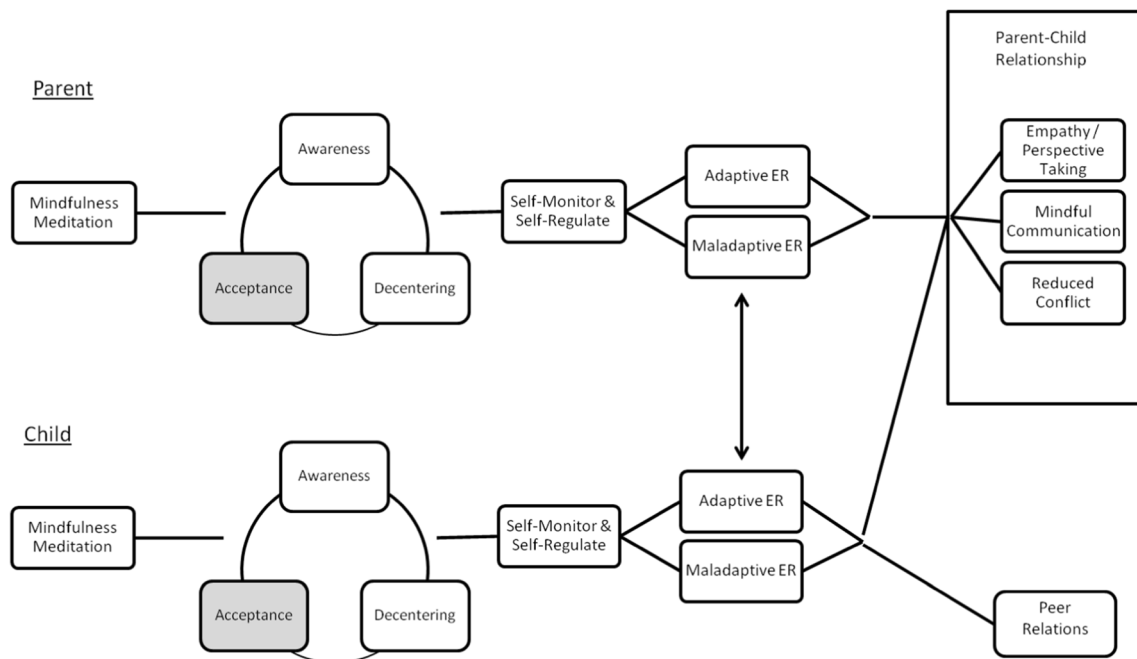
regulation, cueing one another to use calming strategies in moments of stress. Mary explained:

And the breathing, and because we have reminders in the middle of the argument, “have you breathed? Maybe you should.” And he does it to me, and that’s not a bad thing, it’s a good thing. Even if neither one of us walks off and takes a three minute breathing space, just a reminder is, “You know what, maybe we’re carrying this a little much. Let’s stop for a second, rethink the approach, and start over.”

Tony found that using breathing spaces reduced the duration and intensity of their conflict. “So if we are getting into arguments, they’re, first of all, not as long,” he explained, “and not as –” Mary chimed in, “intense.” Tony also commented on their improved ability to listen mindfully during conflict: “like we pretty much realize now to listen to what each other is saying. Before we were just like, I’m louder than you, I’m winning (laughter).” Although they still had disagreements, Tony and Mary felt that the quality of their relationship improved as they learned to regulate their emotions and communicate more respectfully during conflict. Mary reflected that mindfulness did not help them argue less, but it helped them argue better: “yea we argued a lot, we had a lot of frustration that came from a lot of places. Learning how to do that better really was the missing piece.” Tony summarized the overall improvements he perceived in his relationship with his mother, “I mean I just think that we have come a really long way after coming here. This has helped a lot with our relationship.” Similarly, Ron explained how his daughter Georgia reminded him to use mindfulness to manage his anger: “I’m an impatient person. I get upset very easily. Every time I raise my voice or even attempt to raise, my daughter she says “daddy remember, be mindful. Take a breathing space.” So at the time I start to laugh. Overall, families agreed that taking a mindful approach to parent-adolescent conflict reduced the frequency, duration, and intensity of arguments; improved communication and problem-solving; and served as a form of emotional co-regulation during arguments.

## Discussion

Overall, these results clarify and extend the models proposed by Holzel et al. (2011) and Teper et al. (2013) and support a new model of the mechanisms of action in mindfulness training for youth with ADHD and their parents (Fig. 1). Parents and adolescents indicated that enhanced present-focused awareness and detached self-observation were key components of the process of change and that these processes contributed to a sense of clarity about internal and external experiences. Enhanced awareness of mental states appeared to contribute to improved self-monitoring and self-regulation of attention and behavior. Adolescents discussed how their increased awareness of their ADHD symptoms allowed them



**Fig. 1** Working model of the parallel processes and emotional co-regulation contributing to improved relationship quality in joint parent-child mindfulness training. *Shaded items* denote mechanisms that were not supported by current results

to relate to and engage with their symptoms in a new way. Parents and adolescents both identified attention regulation as a mechanism of action, describing their improved abilities to intentionally select and monitor the focus of their attention, recognize distractions, and shift their attention. This reportedly allowed them to engage more fully in social and recreational activities without becoming distracted or losing focus. Parents indicated that enhanced self-awareness and decentering contributed to behavioral regulation. Parents reported that as they became more adept at noticing impulses and “stepping back” from them, they found it easier to evaluate the situation, inhibit inappropriate reactions, and respond in accordance with their intentions. Despite reports of emerging self-management skills and improved attention regulation abilities, adolescents did not explicitly identify behavioral regulation as a mechanism of action. Although they reported a subjective sense that they were better able to manage their ADHD symptoms and behavior, they did not explain how they did so. This may be because adolescents were now consciously aware of the steps they are taking to manage their impulses or because they were not able to articulate their behavioral regulation techniques clearly. Alternatively, inhibition of behavioral impulses may be particularly difficult for youth with ADHD to master, and 8 weeks of mindfulness training may not be sufficient to consolidate gains in this area.

Results of the current study confirm that emotion regulation is a critical mechanism of action and further extend previous models by elucidating the adaptive and maladaptive strategies used to regulate emotions. Parents and adolescents reported less emotional reactivity and recovered more quickly

from negative emotions after mindfulness training. Participants’ descriptions suggest that as they began to view their thoughts and feelings as impermanent mental events rather than representations of self or reality, they experienced increased cognitive flexibility which released them from habitual modes of responding and made it possible for them to consider alternative approaches in emotionally arousing situations. Their enhanced self-monitoring skills alerted them to the need for emotion regulation strategies, and their improved self-regulation skills allowed them to inhibit automatic emotional reactions and select and implement adaptive emotion regulation strategies more often. They perceived themselves to be better able to reappraise situations, generate alternative viewpoints, and productively re-engage in problem-solving in the presence of a stressor. Most participants identified the 3-min breathing space as an explicit emotion regulation strategy they intentionally applied to attenuate distress. Additionally, participants reported a reduction in their tendency to ruminate, suggesting less reliance on maladaptive emotion regulation strategies.

Parents and adolescents described their developing appreciation for the taken-for-granted aspects of their daily lives, a process we labeled as “discovery.” Perhaps as a result of changes in participants’ understanding of, and relationship with, their own minds, they approached experiences with a “fresh perspective” (Matt, age 18) similar to the concept of beginner’s mind. That is, by observing rather than engaging with automatic thoughts, their minds became less scattered and their capacity for concentration was enhanced. This may have allowed them to see their internal and external world

more clearly, without being clouded by habitual interpretations. When they let go of preconceptions and engaged with their environment with a sense of curiosity, they uncovered the essence of phenomena and experienced it more fully. This process warrants further investigation, as it may contribute not only to the reduction of emotional distress and psychopathology but also to improved quality of life and resilience.

Many of the change processes and mechanisms described by MYmind participants were consistent with those outlined by Holzel et al. (2011) (e.g., body awareness, decentering, attention regulation, and emotion regulation). Although Holzel et al. believed decentering occurred only after extensive practice, MYmind participants appeared to achieve partial de-identification with thoughts early in the process. Furthermore, this positioning of self-as-observer was fundamental to the development of other skills, and as such, it is depicted in the initial stages of the current model. These results contrast with Teper et al.'s (2013) model, which did not account for the role of decentering in the process of change. Teper et al.'s conceptualization of executive function (i.e., attention regulation, cognitive flexibility, and inhibition) as a precursor for emotion regulation was borne out by the findings of the current study. These components of executive function are represented in the current model as "self-regulation." The role of acceptance in the process of change remains unclear. Teper et al.'s inclusion of acceptance in their model was consistent with conceptual frameworks and traditional teachings of mindfulness but was not supported by present findings. Acceptance of self was not identified as a mechanism of action in MYmind. Parental acceptance of the limitations of their children, particularly acceptance of symptoms associated with ADHD, was identified as a strategy for regulating emotions and re-engaging in positive parenting. This is consistent with models of mindful parenting, in which non-judgmental acceptance of children as they are in the present moment is believed to reduce emotional reactivity and enhance attunement (Bögels et al. 2010; Coatsworth et al. 2009). This raises the question of whether self-acceptance is a key change process or mechanism of action in MYmind and, if so, where in the sequence of change it exerts its effects.

Participants indicated that the most substantial improvements occurred in the domain of interpersonal relationships. Adolescents reported improved social awareness and more adaptive social behavior after mindfulness training. They reported using mindfulness to manage social anxiety, sustain conversation, read subtle social cues, and consider the perspectives of their peers. These results are notable considering that social skill interventions have demonstrated limited efficacy at ameliorating the social difficulties of adolescents with ADHD (Barkley 2004; Chronis et al. 2006). The limited success of these interventions may be the result of targeting the wrong skills for remediation. Poor social skills may be the result of deficits in the acquisition, performance, or fluency

of a skill, or they may be due to an interfering or competing problem behavior (e.g., anxiety or impulsivity) (Gresham et al. 2001). Adolescents in the current study appeared to possess knowledge of appropriate social behavior but had difficulty performing the behavior in the presence of interfering behavior (e.g., Matt's anxiety). Improved self-monitoring, self-regulation, and emotion regulation skills may have helped participants manage or eliminate the interfering behavior in order to apply their social knowledge fluently. Additionally, in spite of children and adolescents with ADHD having challenges with social perspective taking (Marton et al. 2009; Timmermanis 2015), mindfulness training appeared to cultivate a heightened awareness of others, thereby increasing the participants' sensitivity to the social cues of their peers and alerting them to social problems. In combination, increased social awareness and improved social behavior contributed to greater social connectedness between adolescents with ADHD and their peers.

Consistent with theories of mindful parenting, parents in the current study reported increased empathy, reduced emotional reactivity, improved communication, and lower levels of conflict within the parent-child relationship after mindfulness training. They indicated that they refrained from automatic judgments and attenuated their emotional reactions in order to focus on their children in the present moment, enabling them to listen more openly and communicate more effectively with their children. Interestingly, results did not confirm previous findings of improved relationship satisfaction. Although parents expressed high levels of enjoyment and satisfaction in their relationships with their children, it was unclear whether this represented a change from their typical experience. Since baseline levels of satisfaction were not adequately established, this cannot be considered a treatment effect.

This study suggested that youth contribute to improved parent-child relationship quality in ways similar to their parents. After MYmind, adolescents showed an increased interest in, and understanding of, their parents' experiences. When they considered situations from the perspective of their parents, adolescents made more positive attributions for their parents' behavior (e.g., "she's just trying to help me") and felt less frustrated with their parents. They described communicating more openly with their parents and actively regulating their emotions during conflict. This pattern of results is suggestive of a parallel process of enhanced self-awareness and self-regulation that conjointly contributed to improved parent-child relationships. Furthermore, as each individual of the parent-child dyad became more adept at regulating their emotions, they mutually reinforced the emotion regulation skills of their social partner. Remarkably, after mindfulness training, parents and adolescents described their improved ability to monitor and regulate their own emotions as well as the emotions of their social partner. As a result, both parties remained engaged in the interaction and were able to solve problems

more collaboratively, increasing the likelihood of future positive interactions. Since they received similar mindfulness training, they developed a shared language and a common set of emotion regulation strategies to draw on during conflict. The breathing space became a popular method of co-regulation during parent-child conflict. When one member of the dyad paused during an argument to take a breathing space, it served as a visual reminder and model for the other member to activate their own emotion regulation strategies. In some instances, one member of the dyad explicitly instructed the other to stop and breathe when they noticed their partner becoming dysregulated. Notably, adolescents were just as likely as their parents to initiate co-regulation. Due to the mutually reinforcing nature of this interaction, it is difficult to parse out the relative input of each partner; nonetheless, it is clear that the individual and shared processes depicted in the current model contributed to improved parent-child relationship quality.

The model proposed in Fig. 1 elucidated the process of emotional co-regulation in parent-child mindfulness training. This proposed pathway illustrates the mechanisms by which entrenched negative patterns of interaction between parents and their children can be transformed into more constructive exchanges. This new dyadic pattern was reinforced and maintained for at least 6 weeks after the intervention; future research will be required to determine whether this pattern remains stable over longer periods of time. This model contributes to the burgeoning field of mindfulness research by going beyond self-reported changes of internal processes and highlighting the ways in which mindfulness can, and perhaps should, be operationalized in terms of behavioral changes.

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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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**Ethical Approval** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

**Informed Consent** Informed consent was obtained from all individual participants included in the study.

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