Beyond “Focused and Relaxed”:
The Relationship Between Executive Functioning, Mindful Awareness Practices and Therapeutic Approaches in Alternative School Settings.

by Annie O'Shaughnessy
“Mindful Teaching” with Soryu Forall and Lindsay Foreman
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You might say that we are in the early stages of waking up as a culture to the potential of interiority, to the power of cultivating awareness and an intimacy with stillness and silence. We are beginning to realize the power of the present moment to bring us greater clarity and insight, greater emotional stability, and wisdom. In a word, meditation is no longer something foreign and exotic to our culture.

It is now as American as anything else. It has arrived.

But please keep in mind ... It’s not what you think!

Jon Kabat-Zinn, from *Coming to Our Senses,*

*Healing Ourselves and the World Through Mindfulness.*
Abstract

Research shows a strong connection between poor Executive Functioning (EF) and a long list of conditions and diagnoses typically seen at therapeutic and alternative schools.

EF is negatively affected by different factors common to students who end up in therapeutic environments: cognitive deficits, poor socioemotional adjustment, and poor academic functioning, which may manifest as a lack of concentration, a lack of understanding of cause and effect, an inability to understand mental states, and/or impulsivity. Such disruption in executive function is associated with behavioral characteristics of several childhood onset behavioral disorders including attention deficit hyperactivity disorder (ADHD), autism spectrum disorders, as well as other behavioral problems such as bullying and delinquency (Flook, 2010).

Children from disadvantaged backgrounds have demonstrated particular neurocognitive difficulties in the area of executive functioning (Welsh, 2013). Additional factors that point to the prevalence of poor EF among students at therapeutic schools: Working memory deficits have been seen in individuals with PTSD as well and are thought to be strongly related to prefrontal dysfunction(Welsh, 2013). In addition, there is a strong correlation between substance abuse and executive functioning, especially cognitive flexibility and attention (Al-Zahrani & Elsayed, 2009). The good news is that research shows Mindful Awareness Practices (MAPs) “significantly improved visuo-spatial processing, working memory, and executive functioning (Zeidan, 2009).” And in a study by Lisa Flook, et al., “Participation in a mindful awareness practices program was associated with improvements in behavioral regulation, metacognition, overall EF, and specific domains of EF based on teacher and parent report (Flook, et al., 2010).”

Because of their low EF, this author proposes that students in therapeutic or alternative school settings have less capacity to participate in traditional cognitive therapy requiring EF related brain functions such as meta-cognition and emotional regulation. So, rather than simply report on the research that shows how MAPs improve EF, this paper will explore the complex relationship between EF, MAPs and traditional cognitive therapies in the therapeutic school milieu. Part of this paper will show how traditional cognitive therapies that rely on re-appraisal of emotions and thoughts have limited success due to their reliance on EF skills to engage in that process. In addition, this paper strives to provide the research necessary to develop a compelling argument for MAPs in therapeutic and alternative schools that recognizes the additional complexities and challenges presented by students with psychiatric disorders and trauma, and pays special attention to how these conditions affect and are affected by EF, how MAPs can work to strengthen EF and in turn, support cognitive therapies.

Introduction

Mindful Awareness Practices (MAP) have hit the mainstream. The Mindfulness Based Stress Reduction (MBSR) program developed by Jon Kabat-Zinn in 1979 has nearly 1,000 certified instructors teaching
mindfulness techniques in nearly every state and more than 30 countries (Pickert, 2014). Even three- and four-time NBA champions, the Los Angeles Lakers and Chicago Bulls have trained in Mindfulness to improve their performance (Kabat-Zinn, 2005). A plethora of outcome-based research indicate that MAPs result in improved “cognitive functioning; increased self-esteem; improvements in emotional self-regulation, self-control, and emotional intelligence; increased feelings of well-being; reductions in behavioral problems; decreased anxiety; decreases in blood pressure and heart rate; improvements in sleep behavior; increased internal locus of control; and improved school climate. (Wisner, 2010)” and student’s ability to pay attention and reduce stress (Campbell, 2013). In addition, early research shows that personal training in mindfulness skills can increase teachers’ sense of well-being and teaching self-efficacy, as well as their ability to manage classroom behavior and establish and maintain supportive relationships with students (Meiklejohn, et al.2012).

Given all this evidence and the popularization of Mindfulness in our culture, developing a compelling argument to introduce MAPs into the traditional school setting should be pretty straightforward. Mindfulness teacher and founder of the Center for Mindful Learning, Soryu Forall points out in his class, “Mindful Teaching”: “It would be very hard to argue against the idea that students learn best when they are “focused and relaxed. How many times do teachers remind students throughout the day to ‘settle down’ and ‘pay attention?’ Aren’t they are essentially asking them to relax and focus? Mindfulness teaches them how. It’s a skill to be learned.” But if you were to record what teachers at alternative and therapeutic schools say during the course of the day, you would hear something very different. A teacher might ask, “Why are you so quiet?” and that question might catalyze behaviors that lead to the next question: “I am concerned for your safety. Please climb down off the roof.” or “Let’s find a different way to express your anger other than throwing the chair.” So what role does MAPs play in a school populated by students with diminished EF skills?

What is Executive Functioning (EF)?
The short answer: it’s complicated. There is ongoing debate around which part of the brain is “in-charge” of EF. While the frontal lobe of the prefrontal cortex has a central role in EF, neurobiologist have discovered that many parts of the brain are involved related to both emotional and cognitive activity, and no clear architecture has emerged (Flook, 2010). What we do know is that EF strength is a greater indicator of academic success than I.Q. and is affected by many different factors and encompasses a large set of skills. Lisa Flook et al., in their paper, “Effects of Mindfulness Awareness Practices on Executive Functions in Elementary School Children” provide a definition that reflects some of this complexity:

Executive Functions (EFs) encompass a host of interrelated, yet somewhat independent, processes involved in planning and carrying out regulated, goal-directed activity. Working memory, mental set-shifting, and response inhibition are examples of core executive functions that map onto
dimensions of behavioral self-regulation. Executive functions play a role in children’s emerging academic abilities, above and beyond levels of general intelligence.

Read any admission case review for a student at an alternative or therapeutic school and you will find factors that have been proven to inhibit healthy development of EF. The main factors include:

1. Early trauma/PTSD: There is research showing that healthy EF is restricted neurobiologically due to the trauma’s impact on brain development. (Welsh, 2013).

2. Chronic Stress: Activation of the “stress response has been shown to adversely affect the development of brain structures and neural systems important for regulation of the stress response, as well as executive functions. (Welsh, 2013)

3. Drug/Alcohol abuse: There is a strong relation between abuse of substances and executive functions, especially cognitive flexibility and attention (Al-Zahrani & Elsayed, 2009).

And from http://www.michelfitos.com/2013/04/bigef/:


7. Learning disabilities: http://jad.sagepub.com/content/16/2/138.abstract

8. ADHD

How Does Poor EF Effect Traditional Cognitive Therapies?

Given the major role EF has in academic and socio-behavioral success it follows that students with weak EF end up needing a therapeutic or alternative environment. However as the research below suggests, the quandary present in many therapeutic environments is that the absence of healthy EF skills can undermine the success of traditional cognitive therapies and thereby sidetrack growth in the development of EF, creating a negative feedback loop. The author proposes that without EF skills such as meta-cognition and impulse inhibition, students can’t process events and emotions related to events in order to change future behaviors (the goal of traditional therapies).

Mainstream cognitive behavioral therapy assumes that changing maladaptive thinking leads to change in affect and behavior (Hassett, 2009). This is often called ‘cognitive reappraisal’, which means “to manipulate the input to the emotion-generative system by actively reinterpreting emotional stimuli in a way that modifies their emotional impact (Gross, 1998b)” This kind of emotion regulation has been found to involve a “top-down” regulation of prefrontal brain regions on emotion-generative brain regions, such as the amygdala (Chiesa, et al., 2013). This is also called “reframing.” This process requires recruitment of “higher” brain regions. The same regions that play the primary role in EF. (Chiesa, et al., 2013). (Neurobiological studies of EF indicate extensive prefrontal cortical and anterior cingulate functioning with circuitry links to frontal-striatal assemblies (Flook, 2010)) The author proposes that in students who suffer the effects of one or more of the factors influencing poor EF, this “recruitment”
proves difficult or impossible and limits their ability to respond to “reappraisal” strategies and may even increase stress thereby further limiting EF and therapy efficacy (Margolis, 2011).

MBIs [Mindfulness Based Interventions] might be effective for patients not responding to traditional psychotherapies. Indeed, psychotherapy frequently relies upon top–down mechanisms, such as cognitive reappraisal, to regulate unpleasant emotions. However, the possibility to reappraise one’s own emotions is often impaired in psychological disorders. As a consequence, the effects of MBIs might be superior to the effects of traditional psychotherapies for patients with an impairment of their ability to reappraise unpleasant emotions (Chiesa, et al., 2013)

In addition, poor EF contributes to a student’s failure to inhibit information associated with reexperiencing symptoms or a failure to inhibit unsolicited emotional memories (Welsh, 2013). Related, is the negative relationship between EF and rumination (Howlas and Jankowski, 2013). Dealing with unsolicited emotional memories and rumination both inhibit therapeutic progress.

**What Can Be Done?**

Students with poor EF need an approach that will develop their EF skills while regulating the behaviors that create the negative feedback loop. In their paper, “Meditation, mindfulness and executive control: the importance of emotional and brain-based performance monitoring,” Teper and Inzlicht present compelling evidence that confirms meditation practice is related to better executive control. MAPs have also been shown to increases cognitive flexibility and the ability to shift attention away from challenging emotions or thoughts (Temper and Inzlicht, 2013) that might interfere with therapeutic progress. Based on the key markers used in this study they were able to conclude “that enhanced acceptance of emotional states may be a key reason that meditation improves executive functioning.” This is a notable discovery, as it contradicts the basic goal of cognitive reappraisal which is to change emotional response not accept them. It follows that if students are able to achieve “enhanced acceptance of different emotional states” they are less likely to worry and ruminate over one particular feeling or thought (Davis & Hayes, 2012). Teper & Inzlicht go further to suggest that the nonjudgmental acceptance of thoughts and emotions are integral to the effective initiation of executive control.

“Mindfulness holds that all cognitive and emotional phenomena are merely mental events, and therefore they do not need to be acted upon”. Rather, “a capacity to simply allow these mental events to come and go is systematically developed” (Chambers et al., 2009, pp. 566-567).

According to this claim, mindfulness training involves the development of a greater ability to “stay in touch” with whatever is experienced within the phenomenal field with no need to actively regulate or reappraise what is experienced (Chiesa, et al., 2013)

Pawel and Jankowski, in “A Cognitive Perspective on Mindfulness” state that “a reduction in the intensity of worrying and rumination, may give rise to a freeing of central executive resources that control behavior inhibition, self-monitoring, self-regulation, working memory, regulation of affect, motivation,
arousal, and analysis and synthesis of information (Welsh, 2013)(Flook, et al., 2010). In the same way, a more effective utilization of the specific executive processes connected with attention and working memory become possible (Howlas & Jankowski, 2013).

Anyone who has worked in a therapeutic environment for young people knows what it looks like when a student loses the ability to attend rationally to a situation. Reasoning, reframing, and explaining often have no impact. Stress reduces a student’s EF, which means the student has less impulse control, less ability to see cause and effect, less ability to make reasonable decisions. “Executive development happens primarily in the prefrontal cortex, a region of the brain more sensitive to stress than any other. Unlike anywhere else in the brain, even mild stress can flood the prefrontal cortex with the neurotransmitter dopamine, which causes executive functioning to shut down (Margolis, 2011).” Often, students in a therapeutic environment experience innocuous stimuli as a significant threat triggering the amygdala hijack. Over-simplified, this “amygdala hijack”, a term coined by Daniel Goleman, is a primitive neurological response to a perceived threat that causes us to think less rationally and act more rashly (McKeever, 2011). It is helpful if a person needs to escape a burning building, but not so helpful when the perceived threat is a simple question from a teacher. Research has shown that even short term implementation of MAPs increases a student’s ability to mobilize the necessary regulatory resources (Chiesa, et al., 2013), at the first “pang” of affect, minimizing the negative consequences associated with full-blown emotional reactions (Teper and Inzlicht, 2013) and decreasing emotional reactivity to challenging events (Temper, 2012)

Although emotions have been caricatured as artifacts of our ancient animal pasts, it is becoming increasingly clear that some of the most positive outcomes of mindfulness, such as improved executive control and emotion regulation, rely on an ability to attune to and accept one’s emotional states. (Teper and Inzlicht, 2013)

In addition, improved EF is linked with MAP’s ability to develop increased sensitivity to “affective cues in the experiential field due to improved present-moment awareness and nonjudgmental acceptance.” This refined attunement and openness to subtle changes in affective states fosters executive control because it improves “response to incipient affective cues that help signal the need for control. This, in turn, enhances emotion regulation” (Teper & Inzlecht, 2013). Their research reflects the complexity of interactions between EF and emotions and how MAPs creates a way to more effectively regulate behavior while developing EF skills, specifically the ability to inhibit one’s impulses (Nauman, 2014). Bottom line: “enhanced acceptance of emotional states may be a key reason that meditation improves executive functioning (Teper & Inzlecht, 2013).

Given this research it can be proposed that MAPs are an approach to regulating behavior and developing EF that is not dependent on higher order “top-down” cognitive approaches but enlists a “bottom-up” process that directly modulates the emotion-generative regions of the brain (Chiesa, et al., 2013). This is very important to supporting students who do not have the cognitive resources, in the
moment or ongoing, to process their emotions and monitor their behaviors. Furthermore, research shows that even short sessions of MAPs over the short-term can lead to enduring structural changes in the brain involved with attentional and emotion-generative processes (Chiesa, et al., 2013). The author identifies this as a profound benefit of MAPs for at-risk students who lack the cognitive capacity to engage in traditional therapies because it implies that MAPs actually works on the neurobiological level to strengthen the executive control system of the brain structurally.

Interestingly, MAPs have been shown to increase the effectiveness of Cognitive Therapy approaches. So while the two approaches may seem antithetical they actually compliment each other, which is good news for therapists and social workers who may struggle with the inconsistent gains “due to the supposition that reappraisal requires [the client’s] identification with and aversion toward the original stress appraisal.” In fact, mindfulness is a key mechanism that makes reappraisal possible (Chiesa, et al.,). In addition, improved EF increases a student’s ability to maintain a mindful state. EF, “both attentional and nonattentional, play a crucial role in evoking a mindfulness state.(Howlas & Jankowski, 2013).” In this way a therapeutic school can create a positive feedback loop between MAPs, improved EF, more effective cognitive therapies and the experience of Mindfulness. This research points to the need for the integration of MAPs and EF strengthening therapies.

This integration is already happening. Traditional cognitive therapy models have evolved to incorporate the aspect of non-judgemental acceptance. Dialectical Behavioral Therapy (DBT) emphasizes acceptance of emotional states versus reappraisal strategies. “DBT’s strategies for acceptance include mindfulness (e.g., attention to the present moment, assuming a non-judgmental stance, focusing on effectiveness) and a variety of validation and acceptance-based stylistic strategies ... the treatment goals are to replace “quiet desperation” with non-traumatic emotional experiencing” (Dimeff & Linehan, 2001). Also, Mindfulness Based Cognitive Therapy (MBCT), based on the model of MBSR, was developed to prevent the relapse of depression by remediating the negative feedback loop associated with client’s negative associations with depressive emotions (Williams & Kuyken, 2012). “The goal of MBCT is to interrupt these automatic processes and teach the participants to focus less on reacting to incoming stimuli, and instead accepting and observing them without judgment (Felder, 2012).”

Conclusion and Recommendations
Given that the key executive functions of EF, “cognitive flexibility, inhibitory control (self-control), working memory, planning, and self-awareness (Margolis, 2011),” are skills central to successful engagement in therapeutic programming (Welsh, 2013), especially those programs that are reliant on cognitive therapy (Chiesa, et al., 2013) and given that students who need a therapeutic environment have limited or severely limited EF skillset (Welsh, 2013), an approach should be enlisted that improves emotional regulation while developing EFs without the recruitment of higher brain processes. Based on research, the author proposes that MAPs represent this approach. Further to the deficits represented by
poor EF—severely limited self-awareness, behavior inhibition, and emotional regulation—this author believes the delivery of MAPs needs to be woven holistically into the student’s overall treatment plan. In other words, it may not be effective to ask a student with very low EF skills, who may not have the biological capacity, to sit down and practice mindfulness for even five minutes. What the author recommends is a careful design of mindfulness activities that matches the student’s neurobiological development. This recommendation is inspired by the work of Bruce D. Perry who developed the Neurosequential Model of Therapeutics. (NMT).

NMT is not a specific therapeutic technique or intervention; it is a developmentally sensitive, neurobiologically informed approach to clinical work. The NMT integrates several core principles of neurodevelopment and traumatology into a comprehensive approach to the child, family, and their broader community. The NMT process helps match the nature and timing of specific therapeutic techniques to the developmental stage and brain region and neural networks mediating the neuropsychiatric problems (Perry & Hambrick, 2008).

As an example: for a student with very low EF skills due to early trauma this model might include a MAP that uses contact with a large physio-ball as the focus of attention. It is not within the scope of this article to develop a working model of mindfulness practice inclusion using the NMT approach, but given the role that neurobiology plays in NMT, EF development and MAPs, it is clear why NMT should be considered when designing treatment for severely impaired students.

A second recommendation from the author regarding the implementation of MAPs in a therapeutic environment is the intentional creation and cultivation of a culture of acceptance and awareness where teachers model self-awareness themselves and in their interactions with students. For example, the intentional application of Unconditional Positive Regard (UPR) results in such a culture. UPR is a clinical, client-centered approach used by Centerpoint School and credited to humanistic psychologist Carl Rogers. UPR means “valuing the person as doing their best to move forward in their lives constructively and respecting the person’s right to self-determination no matter what they choose to do (Joseph, 2012).” In other words, UPR creates a culture of acceptance—a key tenant of mindfulness. As adults model acceptance and non-judgmental awareness of the student’s behaviors (through verbal noting), the student begins the process of acceptance and self-awareness themselves. And as mentioned before, it is this acceptance of various emotional states that is closely linked to the development of EF skills.

Given the volumes of research that support the use of MAPs to develop EF and the use of MAPs to improve therapeutic outcomes for students and clients, it is clear that they merit inclusion in therapeutic programming. Furthermore, research strongly indicates that students with poor EF skills show a measurably greater rate of improvement in those skills than students with average EF skills (Flook, 2010). High-risk adolescents can sense the benefits of mindfulness meditation after just brief exposure to the practice (Campbell, 2013). In this paper, the author has tried to convey the complexity of the relationship
between MAPs and EF, the challenges of traditional cognitive therapy and to recommend approaches that would support the introduction of MAPs to students with very low EF skills.

Recommended Reading:

- Mindfulness Meditation Empowers Homeless Youth
- The Neurosequential Model of Therapeutics
- Mindfulness, A top-down or bottom-up approach, Chiesa, et al.,
- What are the benefits of mindfulness
- Integrating mindfulness training into K-12 education: Fostering the resilience of teachers and students.
- How Does Mindfulness Improve Self Control?, Greater Good: The Science of a Meaningful Life
- The Mindful Revolution
- Meditation, mindfulness and executive control: the importance of emotional and brain-based performance monitoring.
- School-based Meditation Practices for Adolescents: A Resource for Strengthening Self-Regulation, Emotional Coping, and Self Esteem,
- Calm Classrooms & Caring Schools Resource Page

Click here for a Google Docs record of full research notes related to this paper.

Bibliography


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